SeaLINK+2/232.PC User Manual
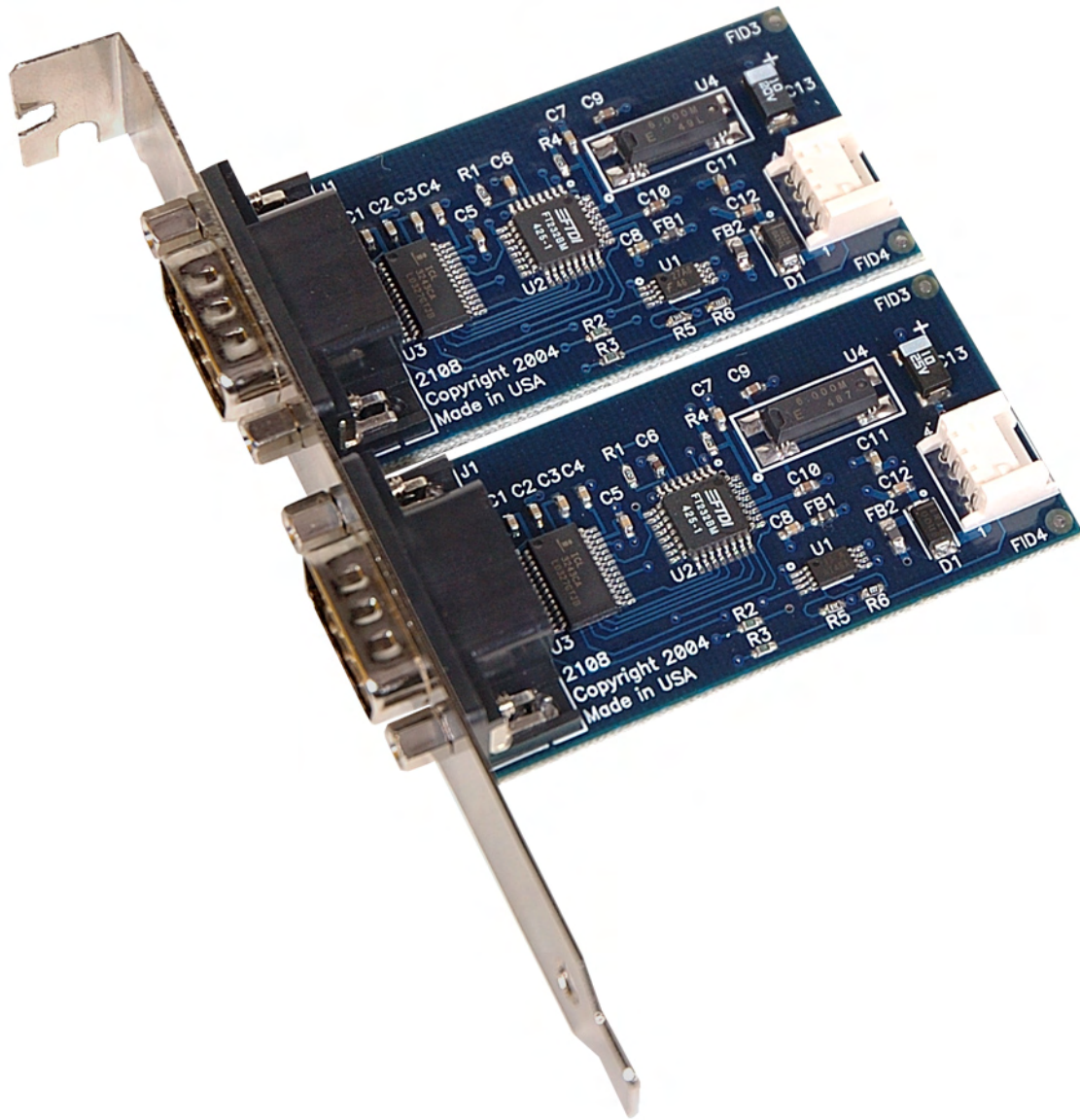
Part Number 2208

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Introduction

The Sealevel Systems SeaLINK+2/232.PC equips the PC with two USB to RS-232 Asynchronous serial ports and is intended for mounting in a spare bracket location, eliminating the need for external converters and providing a clean, professional installation. The SeaLINK+2/232 is actually two SeaLink+232.PC boards (Item# 2108) mounted on a standard size dual-port PC bracket and will be installed as a pair of 2108's. The SeaLINK+2/232.PC is USB bus powered and includes two 14" USB header cables (Item# CA260) that connects to most motherboard USB box header connectors and uses one USB port per serial port.

The SeaLINK+2/232.PC is designed to be used with a variety of Operating Systems including Windows 98/ME/2000/XP. The SeaCOM API (Application Programmer Interface) included on CD with the SeaLINK+2/232.PC provides a variety of useful high-level function calls implemented as a Windows dynamic link library (DLL). In addition to the API, SeaCOM includes sample code and utilities to simplify software development.

Other Sealevel USB Serial I/O Products

SeaLINK+232	(P/N 2101)	- 1-Port RS-232 DB25
SeaLINK+232	(P/N 2105)	- 1-Port RS-232 DB9
SeaLINK+485	(P/N 2102)	- 1-Port RS-422/485/530
SeaLINK+232I	(P/N 2103)	- 1-Port Isolated RS-232
SeaLINK+485I	(P/N 2104)	- 1-Port Isolated RS-422/485/530
SeaLINK+232.PC	(P/N 2108)	- 1-Port RS-232 Box Header
SeaLINK+2/232	(P/N 2201)	- 2-Port RS-232
SeaLINK+2/485	(P/N 2202)	- 2-Port RS-422/485
SeaLINK+2	(P/N 2203)	- 2-Port RS-232/422/485
SeaLINK+4/232	(P/N 2401)	- 4-Port RS-232
SeaLINK+4/485	(P/N 2402)	- 4-Port RS-422/485
SeaLINK+4	(P/N 2403)	- 4-Port RS-232/422/485
SeaLINK+8/232	(P/N 2801)	- 8-Port RS-232
SeaLINK+8/485	(P/N 2802)	- 8-Port RS-422/485
SeaLINK+8	(P/N 2803)	- 8-Port RS-232/422/485

Before You Get Started

What's Included

The SeaLINK+2/232.PC is shipped with the following items. If any of these items is missing or damaged please contact Sealevel for replacement.

- **SeaLINK+2/232.PC Adapter**
  - o **Two SeaLINK+232.PC boards (Item# 2108)**
  - o **Standard size PC bracket**
- **Two CA260 14" USB header cables**
- **Sealevel SeaCOM Software CD**

Optional Items

Depending upon your application, you are likely to find one or more of the following items useful for interfacing the SeaLINK+2/232.PC. All items can be purchased from our website (http://www.sealevel.com/) or by calling 864-843-4343.

- **DB9 Female to DB25 Male 72" Standard RS-232 Cable (Item# CA177)**
  The CA177 connects to a DB9 Male serial port and converts it to a DB25 Male RS-232 connector.

- **DB9 Female to RJ45 Modular Adapter (Item# RJ9S8)**
  The RJ9S8 connects to any DB9 connector and converts it to an RJ45 connector, which allows the use of standard twisted pair cabling. The RJ9S8 ships unassembled and can be configured for virtually any pin out.

Software Installation

Windows 98/ME/2000/XP

Do not install the Adapter in the machine until the software has been fully installed.

NOTE: The SeaLINK+2/232.PC will be installed as a pair of Item# 2108's.

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.

3rd Party Software Support

Third party software support for many HMI/MMI and other process control software is included on the product installation CD. For the most up to date information on third party software support, please visit http://www.sealevel.com/thirdpartysoftware.asp.

Physical Installation

The SeaLINK+2/232.PC can be installed in any spare bracket location.

Do not install the Adapter in the machine until the software has been fully installed.

The SeaLINK+2/232.PC can be connected to any header type USB connector that supports the Intel assigned connector pinout. The SeaLINK+2/232.PC will require no user hardware configuration. Once you have installed the software simply plug the SeaLINK+2/232.PC into two available USB connectors on the motherboard. The drivers that were installed during setup will automatically be used to configure the adapter. You should see one or 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. You can access your new COM: port by using the assigned COM: identifier. 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

Each port of the SeaLINK+2/232.PC utilizes a USB UART. This chip features programmable baud rate, data format, 128 byte Dual Port TX Buffer, and 384 byte Dual Port RX Buffers. The RS-232 transceivers support data rates up to 460.8K baud. Refer to Appendix C for cable length limitations.

Connector Pin Assignments (DB9 Male)

Name		Pin #	Mode
TD	Transmit Data	3	Output
RTS	Request To Send	7	Output
DTR	Data Term Ready	4	Output
GND	Ground	5	
RD	Receive Data	2	Input
DCD	Data Carrier Detect	1	Input
DSR	Data Set Ready	6	Input
CTS	Clear To Send	8	Input
RI	Ring Indicator	9	Input

Note: These assignments meet EIA/TIA/ANSI-574 DTE specifications for DB-9 type connectors.

Electrical Characteristics

Features

- Dual ports mounted in single standard size PC bracket
- No system resources are required (i.e. I/O ports or IRQs)
- Input power protection

Specifications

Temperature Range

- Operating: -0°C – 70°C
- Storage: -50°C – 105°C

Power Requirements

- +5VDC @ 50 mA (per port)

Physical Dimensions (each board, excluding bracket)

- Length: 2.578 inches   (6.548 cm)
- Height: 1.310 inches   (3.327 cm)

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.

Appendix A – Troubleshooting

Sealevel Software is supplied with the Sealevel Systems adapter and may be used in the troubleshooting procedures. Using this software and following these simple steps can eliminate most common problems 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+2/232.PC is configured properly, Sealevel's WinSSD utility and the supplied loopback plug can be used 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+2/232.PC in loopback mode, you should see both the TD and RD echoed as 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+2/232.PC is ready for use in your application.

5. Always use the Sealevel Systems diagnostic software when troubleshooting a problem. This will eliminate any software issues from the equation.

If these steps do not solve your problem, please call Sealevel Systems' Technical Support, (864) 843-4343. Our technical support is free and available from 8:00AM-5PM Eastern Time Monday through Friday. For email support contact mailto:support@sealevel.com.

Appendix B – How To Get Assistance

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

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.

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

Sealevel Systems maintains a Home page on the Internet. Our home page address is http://www.sealevel.com. The latest software updates, and newest manuals are available via our FTP site that can be accessed from our home page.

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 – 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+2/232.PC is a DTE device.
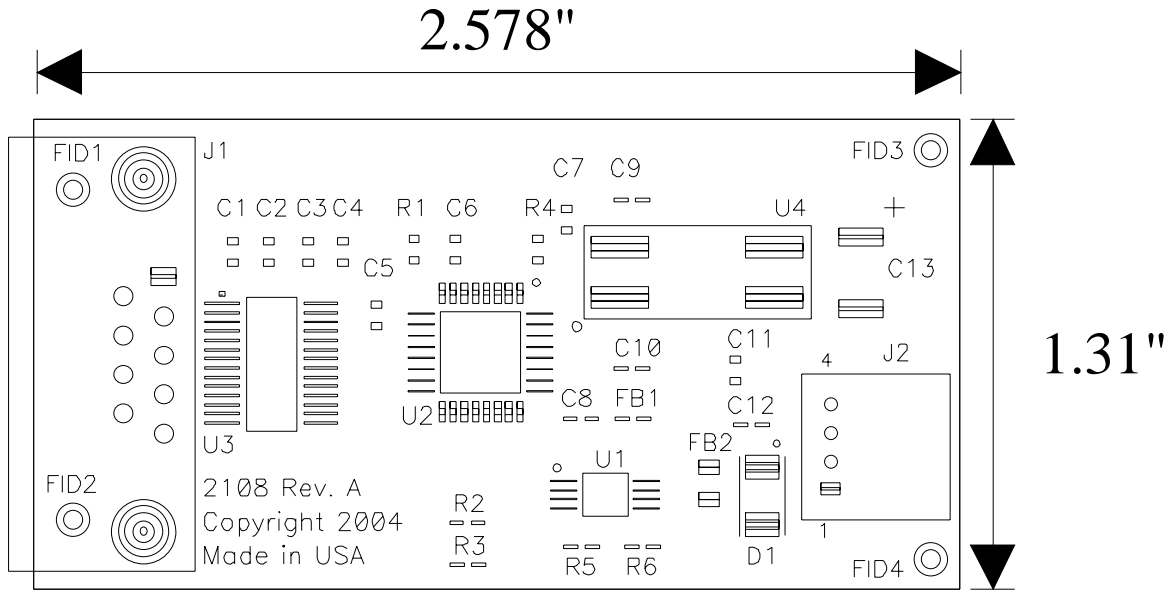
Appendix D – Asynchronous Communications

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. A starting bit followed by a pre-defined number of data bits (5, 6, 7, or 8) defines character boundaries for asynchronous communications. 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.
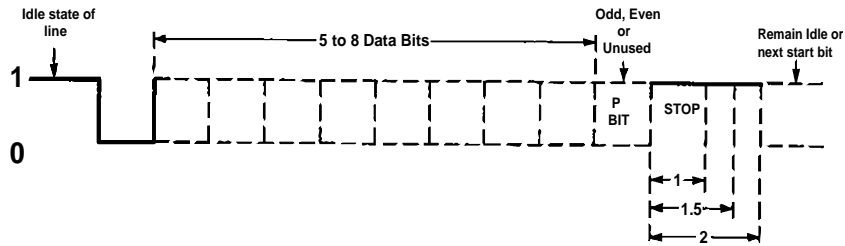
This special bit is called the parity bit. Parity is a simple method of determining if a data bit has been lost or corrupted during transmission. There are several methods for implementing a parity check to guard against data corruption. Common methods are called (E)ven Parity or (O)dd Parity. Sometimes 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 – Silk Screen – 2108 PCB

2.578"

1.31"

FID1 J1   C7 C9   FID3
C1 C2 C3C4 R1 C6   R4   U4
                                     +
            C5   C13
U3   J2
                    C10   C11   4
U2   C8 FB1
                    C12
FID2   FB2
2108 Rev. A   R2   U1
Copyright 2004 R3
Made in USA   R5 R6   D1   1 FID4

Appendix F – 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 the users 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 A - "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"

Warning

This is a Class A Product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures to prevent or correct the interference.

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 FCC/EMC directives.

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.

> **Sealevel Systems, Incorporated**
> **2779 Greenville Highway**
> **P.O. Box 830**
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> **(864) 843-4343   FAX: (864) 843-3067**
> **www.sealevel.com**
> **email: support@sealevel.com**

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

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