

SeaLINK+485-DB9

User Manual | 2107



SEALEVEL®

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Before You Get Started

What's Included

The SeaLINK+485-DB9 (2107) is shipped with the following items. If any of these items is missing or damaged, please contact Sealevel for replacement.

- **Item# 2107 – USB to RS-485 Single Port Serial Interface Adapter**
- **Item# TB34 – DB9 Female to 5 Screw Terminals**

Advisory Conventions



Warning

The highest level of importance used to stress a condition where damage could result to the product, or the user could suffer serious injury.



Important

The middle level of importance used to highlight information that might not seem obvious or a situation that could cause the product to fail.



Note

The lowest level of importance used to provide background information, additional tips, or other non-critical facts that will not affect the use of the product.

Introduction

Overview

The Sealevel Systems SeaLINK+485-DB9 serial interface adapter provides the PC with a single USB to RS-485 asynchronous serial port providing a versatile interface for common RS-485 needs. The SeaLINK+485 connects to a 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.

The SeaLINK® USB to RS-485 serial adapter utilizes Sealevel's expertise in military-grade designs by incorporating a ruggedized, overmolded enclosure design. This improves the reliability and durability in industrial and mobile applications such as GPS navigation systems, barcode readers, signature input devices, serial printers, scales, and similar applications.

The 2107 features programmable baud rate and data formats with 128-byte receive and 256-byte transmit buffers. The USB serial adapter is compatible with all standard PC baud rates (300 baud and above) and supports high-speed communication to 921.6K bps. The 2107 is powered by the USB port and status LEDs molded into the enclosure indicate serial data activity and connection to the host.

The 2107 is specifically designed to be placed on either end of a two-wire half-duplex RS-485 communication link. It provides built in pull-up, pull-down, and terminating resistors that are required for devices at the end of the link. It provides the required pull-up, pull-down, and terminating resistors required for devices at the end of the link. Because the 2107 is designed to fully implement a two-wire half-duplex RS-485 end point, it should not be placed in the middle of a RS-485 link. Because the 2107 is designed to fully implement a RS-485 end point, it should not be placed in the middle of a RS-485 link.

Sealevel SeaCOM USB software drivers and utilities make installation and operation easy using Windows and Linux operating systems. After installing the software, simply plug the 2107 into an available USB port and the serial port is recognized as a standard COM port by the host system enabling compatibility with legacy software.

The attached cable is 44 inches long and fully shielded to protect the 2107 from RF and EMI interference that is common in mobile and industrial environments. Standard operating temperature range is -40° - +75°C.

Features

- Compliant with RoHS and WEEE directives
- High-speed UART with 128-byte Rx FIFO and 256-byte Tx FIFO
- Data rates from 300 bps to 921.6K bps
- Two-wire half duplex operation with built-in end of link pull-up, pull-down, and terminating resistors
- Powered by USB connection
- DB9M connector



Optional Items

Depending upon your application, you are likely to find one or more of the following items useful with the 2107. All items can be purchased from our website (www.sealevel.com) by calling our sales team at (864) 843-4343.

Cables

Terminal Block - DB9 Female to 5 Screw Terminals (RS-422/485) (Part# TB34)	
<p>The TB34 terminal block adapter offers a simple solution for connecting RS-422 and RS-485 field wiring to a serial port. The terminal block is compatible with 2-wire and 4-wire RS-485 networks and matches the RS-422/485 pin-out on Sealevel serial devices with DB9 male connectors. A pair of thumbscrews secures the adapter to the serial port and prevents accidental disconnection. The TB34 is compact and allows multiple adapters to be used on multi-port serial devices, such as Sealevel USB serial adapters, Ethernet serial servers and other Sealevel serial devices with two or more ports.</p>	A black plastic terminal block adapter with a DB9 female connector on one side and five screw terminals on the other. It has two thumbscrews on top to secure it to a port.
DB9F to DB25M (RS-485) Extension Cable (Part# CA177)	
<p>The CA177 is a standard AT-style RS-485 modem cable with a DB9F connector on one end and a DB25M connector on the other. This cable is 72 inches in length.</p>	A white AT-style RS-485 modem cable with a DB9F connector on one end and a DB25M connector on the other.

DB9F to DB9M Extension Cable (Part# CA127)

The CA127 allows users to extend a DB9 cable up to six feet. The connectors are pinned one-to-one, so the cable is compatible with any device or cable that has DB9 connectors.



DB9 Female to 9 Screw Terminal (Part# TB05)

The TB05 terminal block breaks out a DB9 connector to 9 screw terminals to simplify field wiring of serial connections. It is ideal for RS-422 and RS-485 networks, yet it will work with any DB9 serial connection, including RS-232. The TB05 includes holes for board or panel mounting. The TB05 is designed to connect directly to Sealevel DB9 serial cards or any cable with a DB9M connector.



Hubs

High Speed 4-Port USB 2.0 Hub with SeaLATCH USB Ports (Part# HUB4P)

The hub is USB 2.0 compliant, providing a full 480M bps data rate to the host, and is backwards compatible with USB 1.1 and 1.0 devices. The HUB4P includes a wall-mount AC adapter that supplies a full 500mA to each attached USB peripheral. The power supply outputs 5VDC @ 2.4A and has a locking DC connector to prevent accidental removal of the power cable.



High Speed 7-Port USB 2.0 Hub (Part# Hub 7P)

The HUB7P is USB 2.0 compliant, providing a full 480M bps data rate to the host, and is backwards compatible with USB 1.1 and 1.0 devices. The powered hub includes a wall-mount AC adapter that supplies a full 500mA to each attached USB peripheral. The power supply outputs 5VDC @ 4A and has a locking DC connector to prevent accidental removal of the power cable. The hub is housed in a rugged plastic enclosure and status LEDs indicate external power, connection to the host, and fault conditions.



Adapters and Converters

DB9F to RJ45 Modular Adapter (Item# RJ9S8)

The RJ9S8 is a DB9 female to RJ45 adapter. It can be configured without tools and is an excellent choice for using available infrastructure wiring.



DB9 Female to DB9 Male - Serial Surge Suppressor (Part# SS-DB9)

User configurable for use with male or female DB9 ports, the SS-DB9 protects all 9 lines, plus D shell chassis. Convenient DB9 input and output connects directly to the protected port, obtaining a ground outlet from the computer chassis. Surge suppression is handled with balanced arrays of high-speed avalanche diodes that divert excess energies created by electrostatic discharges, faulty wiring, or lightning away from network interface connections.



Product Family

Whether you require one serial port or 16, SeaLINK USB serial adapters will have you quickly communicating with RS-232, RS-422, and RS-485 peripherals. Unlike traditional UART-based devices, SeaLINK USB products use a state-machine architecture that reduces host processor overhead for faster, more reliable communications. Sealevel's SeaCOM software drivers and utilities make installation and operation easy using Windows and Linux operating systems.

Part #	Description
2105R	USB to 1-Port RS-232 DB9 Serial Interface Adapter
2106	USB to 1-Port RS-422 DB9 Serial Interface Adapter
2107	USB to 1-Port RS-485 DB9 Serial Interface Adapter
2113	USB to 1-Port RS-232, RS-422, RS-485 DB9 Serial Interface Adapter
2123	USB to 1-Port RS-232, RS-422, RS-485 (Software Configurable) DB9 Serial Interface Adapter
2101	USB to 1-Port RS-232 DB25 Serial Interface Adapter
2102	USB to 1-Port RS 422, RS-485, RS-530 DB25 Serial Interface Adapter
2103	USB to 1-Port Isolated RS-232 DB25 Serial Interface Adapter
2104	USB to 1-Port RS 422, RS-485, RS-530 DB25 Serial Interface Adapter
2108	Embedded USB to 1-Port RS-232 DB9 Serial Interface Adapter with Low Profile PC Bracket
2128	Embedded USB to 1-Port RS-232, RS-422, RS-485 (Software Configurable) DB9 Serial Interface Adapter with PC Bracket
2213	USB to 2-Port Isolated RS-232, RS-422, RS-485 DB9 Serial Interface Adapter
2223	USB to 2-Port RS-232, RS-422, RS-485 (Software Configurable) DB9 Serial Interface Adapter
2201	USB to 2-Port RS-232 DB9 Serial Interface Adapter
2202	USB to 2-Port RS-422, RS-485 DB9 Serial Interface Adapter
2203	USB to 2-Port RS-232, RS-422, RS-485 DB9 Serial Interface Adapter

2208	Embedded USB to 2-Port RS-232 DB9 Serial Interface Adapter with Standard Size PC Bracket
2228	Embedded USB to 2-Port RS-232, RS-422, RS-485 (Software Configurable) DB9 Serial Interface Adapter with PC Bracket
2401	USB to 4-Port RS-232 DB9 Serial Interface Adapter
2402	USB to 4-Port RS-422, RS-485 DB9 Serial Interface Adapter
2403	USB to 4-Port RS-232, RS-422, RS-485 DB9 Serial Interface Adapter
2404	USB to 4-Port RS-232 RJ45 Serial Interface Adapter
2407	USB to 4-Port RS-232, RS-485 RJ45 VersaCom Serial Interface Adapter
2423	USB to 4-Port RS-232, RS-422, RS-485 (Software Configurable) DB9 Serial Interface Adapter
2433	USB to 4-Port RS-232, RS-422, RS-485 (Software Configurable) DB9 Serial Interface Adapter
641U	USB to RS-232 RJ45 Serial Interface Adapter
647U	USB to RS-232, RS-485 RJ45 VersaCom Serial Interface Adapter
2801	USB to 8-Port RS-232 DB9 Serial Interface Adapter
2802	USB to 8-Port RS-422, RS-485 DB9 Serial Interface Adapter
2803	USB to 8-Port RS-232, RS-422, RS-485 DB9 Serial Interface Adapter
2804	USB to 8-Port RS-232 RJ45 Serial Interface Adapter
2807	USB to 8-Port RS-232, RS-485, RJ45 VersaCom Serial Interface Adapter
2823	USB to 8-Port RS-232, RS-422, RS-485 (Software Configurable) DB9 Serial Interface Adapter
2833	USB to 8-Port RS-232, RS-422, RS-485 DB9 Serial Interface Adapter
681U	USB to RS-232 RJ45 Serial Interface Adapter
687U	USB to RS-232, RS-485 RJ45 VersaCom Serial Interface Adapter
2161	USB to 16-Port RS-232 RJ45 Serial Interface Adapter
2167	USB to 16-Port RS-232, RS-485 RJ45 VersaCom Serial Interface Adapter
2108S	Embedded USB to 1-Port RS-232 DB9 Serial Interface Adapter with Standard Size PC Bracket
2123-OEM	USB to 1-Port RS-232, RS-422, RS-485 (Software Configurable) DB9 Serial Interface Adapter
2223-KT	USB to 2-Port RS-232, RS-422, RS-485 (Software Configurable) DB9 Serial Interface Adapter
2223-OEM	USB to 2-Port RS-232, RS-422, RS-485 (Software Configurable) DB9 Serial Interface Adapter
641U-OEM	USB to RS-232 RJ4 Serial Interface Adapter

647U-OEM	USB to RS-232, RS-485 RJ45 VersaCom Serial Interface Adapter
681U-OEM	USB to RS-232 RJ45 Serial Interface Adapter
687U-OEM	USB to RS-232, RS-485 RJ45 VersaCom Serial Interface Adapter
2106-RoHS	RoHS Compliant USB to 1-Port RS-422 DB9 Serial Interface Adapter
2102-RoHS	RoHS Compliant USB to 1-Port RS-422, RS-485, RS-530 DB25 Serial Interface Adapter
2201-RoHS	RoHS Compliant USB to 2-Port RS-232 DB9 Serial Interface Adapter
2203-RoHS	RoHS Compliant USB to 2-Port RS-232, RS-422, RS-485 DB9 Serial Interface Adapter
2401-RoHS	RoHS Compliant USB to 4-Port RS-232 DB9 Serial Interface Adapter
2403-RoHS	RoHS Compliant USB to 4-Port RS-232, RS-422, RS-485 DB9 Serial Interface Adapter
2801-RoHS	RoHS Compliant USB to 8-Port RS-232 DB9 Serial Interface Adapter
2404-RoHS	RoHS Compliant USB to RS-232 RJ45 Serial Interface Adapter for Powering 5VDC Serial Peripherals
2402-DC12	RoHS Compliant USB to RS-232 RJ45 Serial Interface Adapter for Powering 12VDC Serial Peripherals
2404-DC24	USB to RS-232 RJ45 Serial Interface Adapter for Powering 24VDC Serial Peripherals
2407-DC05	USB to 4-Port RS-232, RS-485 RJ45 VersaCom Serial Interface Adapter for Powering 5VDC Serial Peripherals
2407-DC12	USB to 4-Port RS-232, RS-485 RJ45 VersaCom Serial Interface Adapter for Powering 12VDC Serial Peripherals
2407-DC24	USB to 4-Port RS-232, RS-485 RJ45 VersaCom Serial Interface Adapter for Powering 24VDC Serial Peripherals
2804-DC05	USB to 8-Port RS-232 RJ45 Serial Interface Adapter for Powering 5VDC Serial Peripherals
2804-DC12	USB to 8-Port RS-232 RJ45 Serial Interface Adapter for Powering 12VDC Serial Peripherals
2804-DC24	USB to 8-Port RS-232 RJ45 Serial Interface Adapter for Powering 24VDC Serial Peripherals
2807-DC05	USB to 8-Port RS-232, RS-485 RJ45 VersaCom Serial Interface Adapter for Powering 5VDC Serial Peripherals
2807-DC12	USB to 8-Port RS-232, RS-485 RJ45 VersaCom Serial Interface Adapter for Powering 12VDC Serial Peripherals
2807-DC24	USB to 8-Port RS-232, RS-485 RJ45 VersaCom Serial Interface Adapter for Powering 24VDC Serial Peripherals

Electrical Specifications

The SeaLINK+485-DB9 utilizes a USB UART. This chip features programmable baud rate, data format, 128-byte RX buffer, and 256-byte TX buffer. The RS-485 two-wire transceiver supports data rates from 300 baud up to 921.6K baud. Refer to Appendix C for cable length limitations.

Connector Pin Out

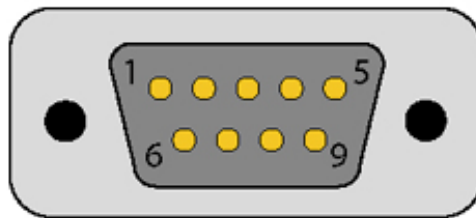
RS-485 (DB-9 Male)



Note that pins 1 and 4 are internally connected and either may be used for the (+) wire in a two-wire half duplex RS-485 link. Pins 2 and 3 are internally connected and either may be used for the (-) wire.



Note that pins 1 and 4 are internally pulled up to +5 volts through a 510-ohm resistor. Pins 2 and 3 are internally pulled down to ground through a 510-ohm resistor. The (+) and (-) pins are connected together with a 120-ohm terminating resistor. This device should only be used at either end of a RS-485 link.



Pin #	Signal	Name	Mode
1	DATA+	Data Positive	I/O
2	DATA-	Data Negative	I/O
3	DATA-	Data Negative	I/O
4	DATA+	Data Positive	I/O
5	GND	Ground	
6	N/C	Not Connected	N/A
7	N/C	Not Connected	N/A
8	N/C	Not Connected	N/A
9	N/C	Not Connected	N/A

Technical Specifications

Environmental Specifications

Specification	Operating	Storage
Temperature Range	-40° to 75° C (-40° to 185° F)	-50° to 105° C (-58° to 221° F)
Humidity Range	10 to 90% R.H. Non-Condensing	10 to 90% R.H. Non-Condensing

Power Consumption

Supply line	+5 VDC
Rating	100 mA

(Maximum) via locking 2.1mm Barrel plug

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.

Hardware Configuration

Ruggedized Overmold Enclosure

The 2107 is built for harsh conditions and features a military-grade, ruggedized, overmolded enclosure. This improves the reliability and durability in industrial and mobile applications.

DB9M Serial Connector

The 2107 includes a DB9 male serial connector on one end of the device. The pin assignments for this connector are detailed in the previous Electrical Specifications section.

Status LEDs

A pair of status LEDs indicate:

- **Tx (Red)** – Light when data is being transmitted
- **Rx (Green)** – Light when data is being received

Attached USB Cable

The attached cable has a black jacket over a braided shield. The cable is approximately 44” overall with a USB Type A connector, which is compatible with any available USB port on a host computer or USB hub. Self-powered hubs can be used as long as they provide a minimum of 100mA to each USB port. The 2107 is compatible with USB 2.0 ports and is USB 1.1 compliant.



Installation & Configuration

Software Installation

Windows Installation



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



Only users running Windows 7 or newer should utilize these instructions for accessing and installing the appropriate driver via Sealevel's website. If you are utilizing an operating system prior to Windows 7, please contact Sealevel by calling 864.843.4343 or emailing support@sealevel.com to receive access to the proper driver download and installation instructions.

1. Begin by locating, selecting, and installing the correct software from the [Sealevel software driver database](#).
2. Select the Part Number (**2107**) for your device from the listing.
3. Click the 'Install Drivers' button.
4. The setup file will automatically detect the operating environment and install the proper components.

To confirm that the SeaCOM driver has been successfully installed, click on the 'Start' button, and then select 'All Programs'. You should see the 'SeaCOM' program folder listed.

You are now ready to proceed with connecting the 2107 to your system. Refer to the Hardware Installation section for details.



Windows NT is not USB aware and thus cannot support this device.

Upgrading to the current SeaCOM driver

1. Download the current driver using the Instructions from the 'Software Installation' section above. Please take note of the destination directory it will save to.
2. Uninstall the currently loaded driver SeaCOM driver found in the Control Panel. Prior to Windows Vista SeaCOM will be populated in 'Add/Remove Programs' list. In Vista and newer OSs it will be found in the 'Programs and Features' list.
3. Navigate to the Device Manager and remove the Sealevel adapter by right clicking on the line item choosing 'Uninstall'. Depending on your product, it can be found under either 'Multiport Serial adapters' or 'Universal Serial Bus controllers'.
4. Single port ISA cards and PCMCIA cards will need to be uninstalled under 'Ports (COM & LPT)'.
5. In the Device Manager under 'Action', choose 'Scan for Hardware changes'. This will prompt the installation of the adapter and associate it with the newly installed SeaCOM driver.
6. Proceed with the hardware installation of your SeaLINK USB serial adapter.

Hardware Installation

The SeaLINK+485 can be connected to any Upstream Type A USB port at the PC host or an Upstream Hub. Since it is hot pluggable, there is no need to power down your computer prior to installation. The SeaLINK+485 requires no user hardware configuration. Once you have installed the software simply plug the USB connector into an available USB port. The drivers that were installed during setup will automatically be used to configure the adapter. In Windows XP and previous OS versions, you should see one or more 'Found New Hardware' windows, indicating the actual device being created and enumerated. See below. In Vista and newer operating systems, the enumeration occurs automatically without user interaction.

N Once the device has been connected, the Found New Hardware wizard will appear twice – first for the USB part, and then for the serial port that you are installing.

The following instructions are applicable to the Windows XP operating system and may vary depending on your version of Windows.

1. After the software installation is complete, plug the 2107 into an available USB port on the computer or USB hub.
2. A 'Found New Hardware' alert will appear above the system tray.



3. The 'Found New Hardware Wizard' will appear.

4. Choose 'No, not this time' and click 'Next' to proceed.



5. Choose 'Install the software automatically' and click 'Next'.



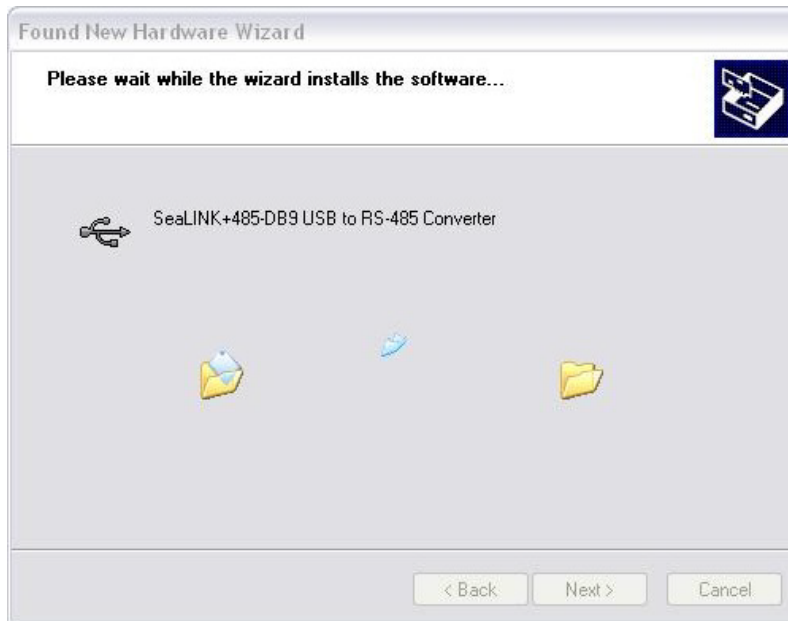
- The 'Hardware Wizard' will search for the proper drivers; however, it may be interrupted by a message stating that the hardware has not passed Windows certification. Click 'Continue Anyway'.



All SeaCOM software and drivers have been fully tested by Sealevel. Clicking 'Continue anyway' will not harm your system.



- The appropriate drivers for your SeaLINK device and version of Windows will be installed as shown.



8. Click 'Finish' to complete the installation of your hardware.



The 'Found New Hardware Wizard' appears a second time; repeat steps 4-8.

9. When the 'Found New Hardware' alert informs you that your hardware is installed and ready to use, you can proceed with verifying the installation to check functionality and/or locate the COM port assignments, if necessary.



Verifying Installation

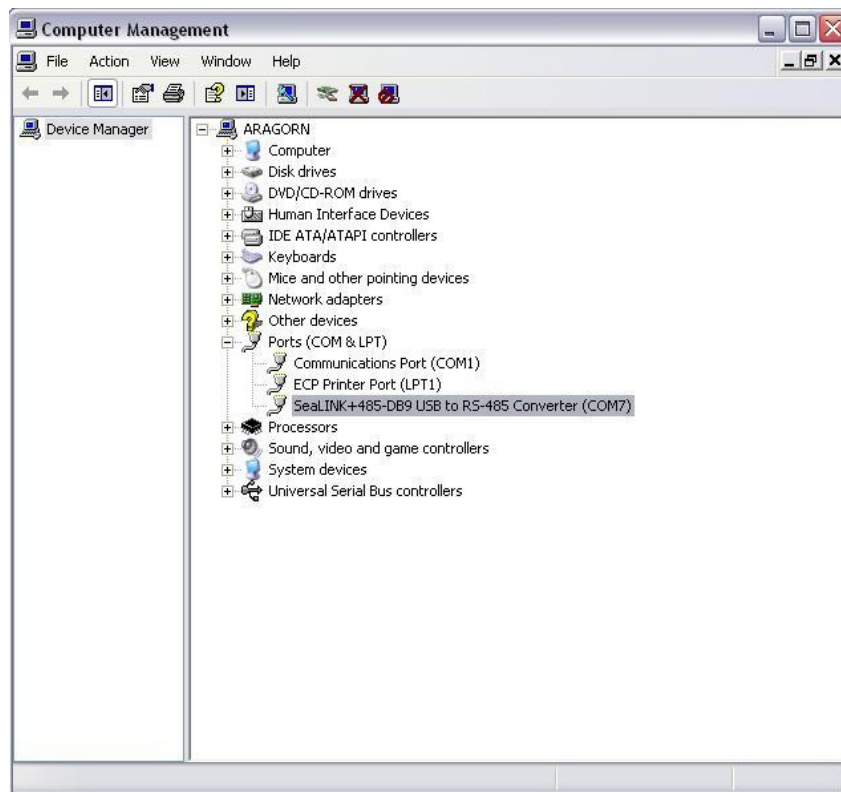
To confirm that the serial port has been successfully installed, look in Device Manager under 'Ports (COM & LPT)' and the COM assignment will be included with the associated COM number in parentheses.

To access Device Manager, follow the steps below:

1. Right click on 'My Computer' icon on your desktop or in the Start menu.
2. Click 'Manage' in the fly out menu to launch the 'Computer Management' console window.
3. In the left pane under 'System Tools', click 'Device Manager'.
4. In right pane near the bottom, expand the 'Ports (COM & LPT)' section by clicking the '+' symbol.
5. You should now see the COM assignment with the associated COM number in parentheses.



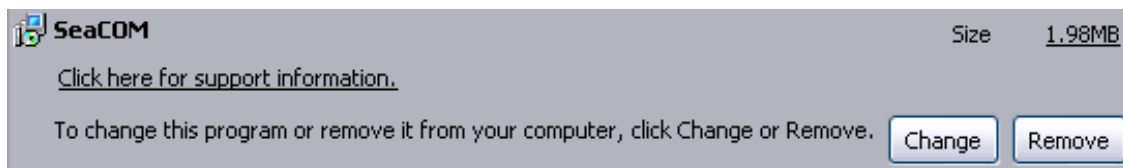
Your system will assign the next available COM number, which will vary by computer (COM4 as shown in this example).



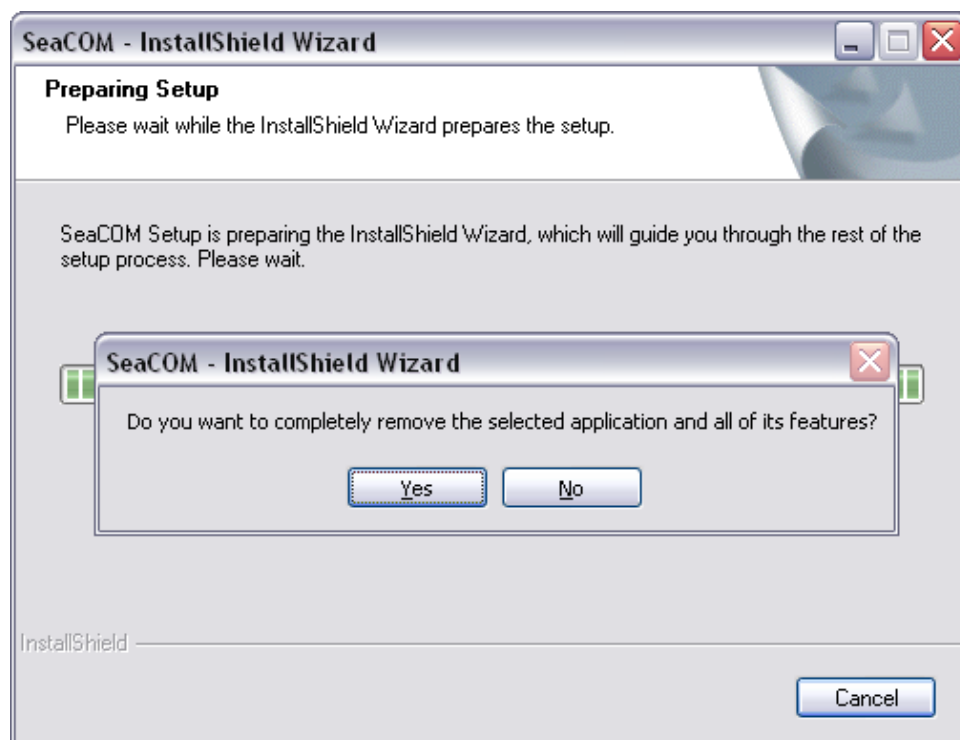
Remove Software Using Control Panel

Make sure you have first removed the hardware using the instructions on the previous page before removing the software, otherwise remnants of the configuration settings will be left on your system. Keep the SeaLINK device plugged in until the software has been completely uninstalled.

1. Access the Control Panel by clicking the 'Start' button, and then 'Control Panel'.
2. In the Control Panel window, double-click the 'Add or Remove Programs' icon (In Windows Vista, double-click on 'Programs and Features').
3. The Add or Remove Programs window will list all currently installed software on your system. Once the 'Currently installed programs' list populates, locate, and select the entry for 'SeaCOM'.
4. Click the 'Remove' button.



5. The 'SeaCOM – InstallShield Wizard' window will appear along with a dialog box asking you to confirm. Click the 'Yes' button to continue.



6. When the removal process completes, click the 'Finish' button to close the window. A dialog box appears to confirm the removal success. Click the 'OK' button on the dialog box.
7. If you are upgrading software, leave the SeaLINK device plugged in and follow the instructions in the 'UPGRADING TO THE CURRENT SEACOM DRIVER' section above.

Appendix A - Handling Instructions

ESD WARNINGS

Electrostatic Discharges (ESD)

A sudden electrostatic discharge can destroy sensitive components. Proper packaging and grounding rules must therefore be observed. Always take the following precautions:

1. Transport boards and cards in electrostatically secure containers or bags.
2. Keep electrostatically sensitive components in their containers, until they arrive at an electrostatically protected workplace.
3. Only touch electrostatically sensitive components when you are properly grounded.
4. Store electrostatically sensitive components in protective packaging or on anti-static mats.

Grounding Methods

The following measures help to avoid electrostatic damages to the device:

1. Cover workstations with approved antistatic material. Always wear a wrist strap connected to a properly grounded workplace.
2. Use antistatic mats, heel straps, and/or air ionizers for more protection.
3. Always handle electrostatically sensitive components by their edge or by their casing.
4. Avoid contact with pins, leads, or circuitry.
5. Turn off power and input signals before inserting and removing connectors or connecting test equipment.
6. Keep work area free of non-conductive materials such as ordinary plastic assembly aids and Styrofoam.
7. Use field service tools such as cutters, screwdrivers, and vacuum cleaners that are conductive.

Appendix B – Troubleshooting

The adapter should provide years of trouble-free service. However, in the event that it appears to be functioning incorrectly, the following tips 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. Locate the COM ports for your device in Device Manager (described under 'Verifying Installation' in the Installation and Configuration section of this manual).
4. 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 8:00 AM to 5:00 PM Eastern Time Monday through Friday. For email support contact support@sealevel.com.

Appendix C – Electrical Interface

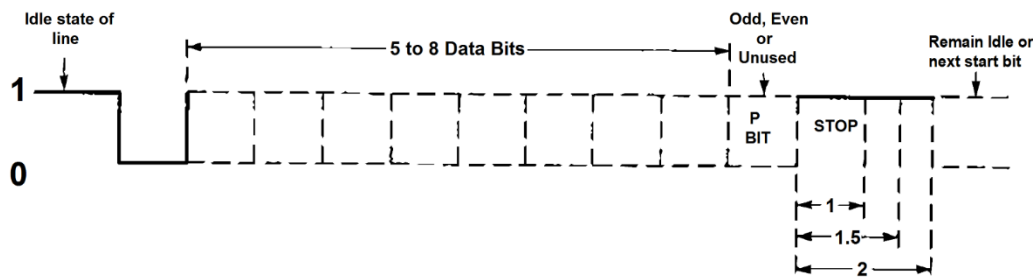
RS-485

RS-485 is backwardly compatible with RS-422; however, it is optimized for party line or multi-drop applications. The output of the RS-422/485 driver is capable of being **Active** (enabled) or **Tri-State** (disabled). This capability allows multiple ports to be connected in a multi-drop bus and selectively polled. RS-485 allows cable lengths up to 4000 feet and data rates up to 10 Megabits per second. The signal levels for RS-485 are the same as those defined by RS-422. RS-485 has electrical characteristics that allow for 32 drivers and 32 receivers to be connected to one line. This interface is ideal for multi-drop or network environments. RS-485 tri-state driver (not dual-state) will allow the electrical presence of the driver to be removed from the line. Only one driver may be active at a time and the other driver(s) must be tri-stated. RS-485 can be cabled in two ways, two wire and four wire mode. Two wire mode does not allow for full duplex communication and requires that data be transferred in only one direction at a time. For half-duplex operation, the two transmit pins should be connected to the two receive pins (Tx+ to Rx+ and Tx- to Rx-). Four wire mode allows full duplex data transfers. RS-485 does not define a connector pin-out or a set of modem control signals. RS-485 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.

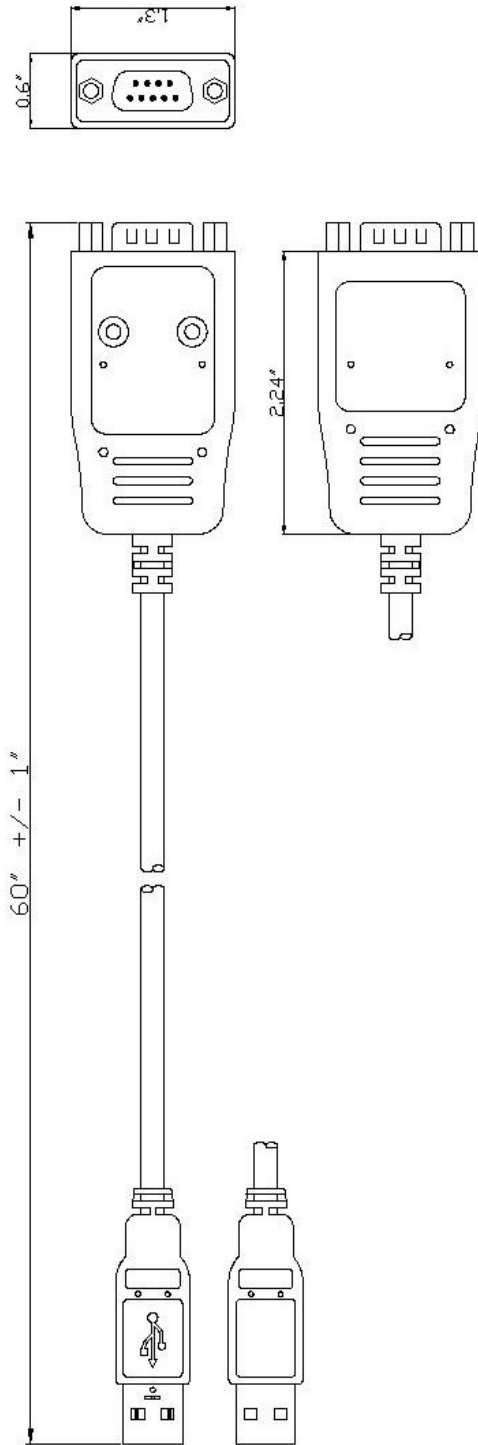
Asynchronous communications is the standard means of serial data communication for PC compatibles and PS/2 computers. The original PC was equipped with a communication or COM: port that was designed around an 8250 Universal Asynchronous Receiver Transmitter (UART). This device allows asynchronous serial data to be transferred through a simple and straightforward programming interface. A start 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.



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 E – Cable Drawing



Appendix F – How To Get Assistance

Please refer to: [Appendix A](#) – Troubleshooting Guide prior to calling Technical Support.

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 web page on the Internet. Our home page address is www.sealevel.com. The latest software updates, and newest manuals are available via our web site.

Technical support is available Monday to Friday from 8:00 AM to 5:00 PM 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.

Warranty

Sealevel's commitment to providing the best I/O solutions is reflected in the Lifetime Warranty that is standard on all Sealevel manufactured I/O 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 achieved ISO-9001:2015 certification in 2018.

Warranty Policy

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 the warranty period. 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, abuse, accidents, or acts of nature are not covered under this warranty.

Warranty service may be obtained by delivering the Product to Sealevel and providing proof of purchase. Customer agrees to ensure 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.

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

Non-Warranty Repair/Retest

Products returned due to damage or misuse and Products retested with no problem found are subject to repair/retest charges. A purchase order or credit card number and authorization must be provided in order to obtain an RMA (Return Merchandise Authorization) number prior to returning Product.

How to obtain an RMA (Return Merchandise Authorization)

If you need to return a product for warranty or non-warranty repair, you must first obtain an RMA number. Please contact Sealevel Systems, Inc. Technical Support for assistance:

Available	Monday – Friday, 8:00AM to 5:00PM EST
Phone	864-843-4343
Email	support@sealevel.com

Trademarks

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