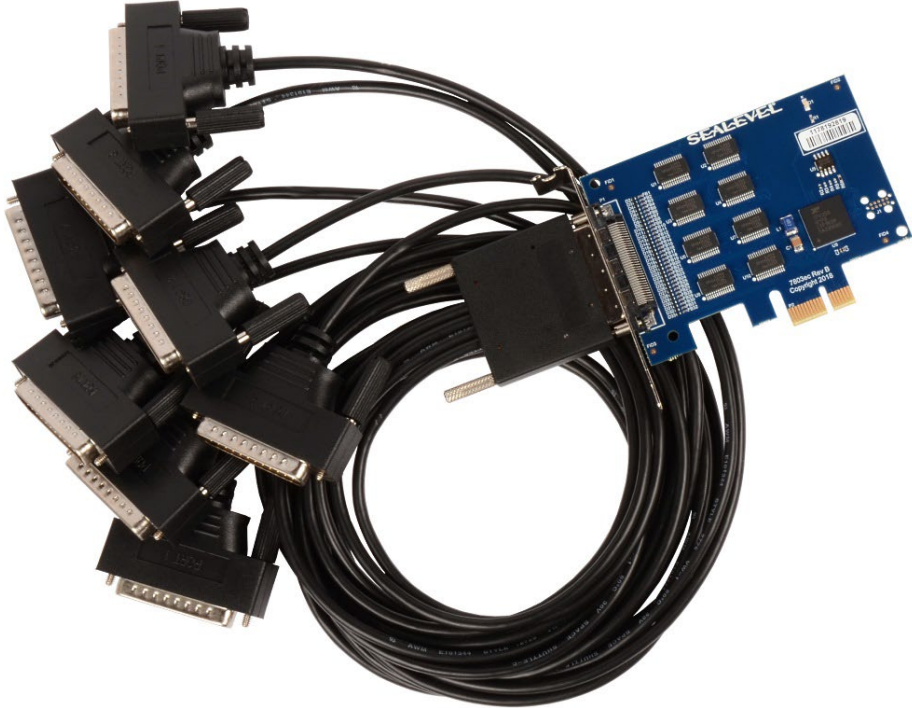


COMM+8.PCIe

User Manual | 7803e and 7803ecS



SEALEVEL®

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Introduction

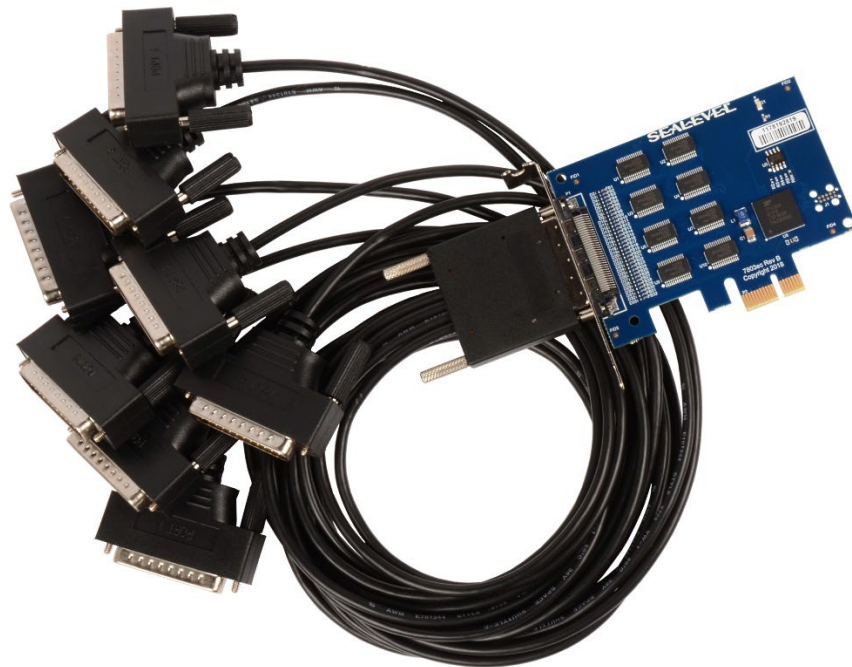
The Sealevel COMM+8.PCIe is a PCI Express 2.0 Gen 1 compliant interface adapter with eight RS-232 asynchronous serial ports supporting data rates up to 230,400 bps, for industrial automation and control applications.

All modem control signals are implemented for maximum compatibility with a wide range of serial peripherals. The Sealevel SeaCOM for Windows software driver and utilities make installation and operation easy in Windows 7/8.1/10.

The product is RoHS compliant and meets the requirements of RoHS (2011/65/EU) directive.

Features

- Eight RS-232 serial ports
- High-speed UART with 256-byte TX and RX FIFOs
- Asynchronous data rates up to 230,400 bps
- Includes 36" cable that terminates to eight DB25M connectors (Part Number CA202)



Before You Get Started

What's Included

The COMM+8.PCIe is shipped with the following items. If any of these items are missing or damaged, please contact Sealevel for replacement.

- **COMM+8.PCIe Adapter**
 - **7803ec – PCIe Board with Low Profile PC Bracket**
 - **7803ecS – PCIe Board with Standard Height PC Bracket**
- **CA202 – Micro 68-pin to (8) DB25M Cable, 36in Length**

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.

Optional Items

Depending upon your application, you are likely to find one or more of the following items useful with the 7803ec. All items can be purchased from our website (www.sealevel.com) by calling our sales team at (864) 843-4343.

DB25 Serial Extension Cable (Part Number CA104)

The CA104 is a standard DB25F to DB25M serial extension cable. Extend a DB25 cable or locate a piece of hardware where it is needed with this six foot (72 inch) cable. The connectors are pinned one-to-one, so the cable is compatible with any device or cable with DB25 connectors. The cable is fully shielded against interference and the connectors are molded to provide strain relief. Dual metal thumbscrews secure the cable connections and prevent accidental disconnection.



DB25F to DB9M Adapter – RS-232 Converter (Part Number CA140)

Converts an RS-232 DB25 Male connector to an RS-232 DB9 Male connector.



DB25F to RJ45 Modular Adapter (Part Number RJ25S8)

DB25 Female to RJ45 Modular Adapter. Excellent choice for using available infrastructure wiring. Item ships unassembled and can be easily configured without tools.



Terminal Blocks

Terminal Block (Part Number TB04-KT)

The TB04-KT terminal block can be used to break out serial and digital DB25 connectors to 25 screw terminals. The TB04-KT makes it easy to field wire networks with different pin out configurations. Compatible with any cable with a DB-25 male connector.

The TB04-KT ships with a terminal block, a 6 inch piece of slotted Snap Track, and two DIN-rail mounting clips.



Terminal Block Kit (Part Number KT104)

The KT104 terminal block kit bundles a DB25 breakout board, a 6 inch piece of slotted Snap Track, two DIN-rail mounting clips, and a DB25 serial extension cable.

Developed to simplify field wiring requirements, the Terminal Block KT104's onboard DB25F can be connected directly to boards that include DB25M cables.



Card Setup

Address and IRQ Selection

The 7803ec is automatically assigned memory addresses and IRQs by your motherboard BIOS or by a “Plug-n-Play” Operating System. Adding or removing other hardware or moving the adapter to another slot may change the assignment of memory addresses and IRQs.

Clock Modes and Baud Rates

The 7803ec derives a 125MHz clock from the PCI express link for the Baud Rate Generator (BRG) which is divided by a clock prescaler (1 or 4) and a 16-bit clock divisor to obtain a sampling clock of 16X, 8X, or 4X the serial data rate. The BRG offers a wide range of possible baud rates. Under Windows and Linux, the best choice of divisor is made automatically by the driver. The bit rate error is within the +/- 2% recommended tolerance for proper serial communication.

On-board LED indicator

Power LED (D1) is lit when card is powered

Software Installation

Windows Installation



Do not connect the hardware 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.

The current versions of Sealevel software packages can be obtained from the Sealevel website (see following instructions). If you already have the Sealevel software, proceed to the Windows or Linux installation section. Begin by locating, selecting, and installing the correct software:

- Sealevel SeaCOM software for Windows and Linux operating systems is available at these links:
 - o [Software for Windows](#)
 - o [Software for Linux](#)
 - Choose the link for the desired software package (SeaCOM) and click on the 'Download File' link to download the current driver.
1. The setup files will automatically detect the operating environment and install the proper components. Follow the information presented on the screens that follow.
 2. A screen may appear with text similar to: "The publisher cannot be determined due to the problems below: Authenticode signature not found." Please click 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.
 3. 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.
 4. The software is now installed, and you can proceed with the hardware installation.



Do not connect the hardware until the software has been successfully installed.



To install Sealevel software, you must log in as an administrator or have administrator privileges in Windows.

5. The following dialog box may appear, as shown below. Click the 'OK' button to continue.



All Sealevel Systems software drivers have been fully tested by Sealevel. Clicking 'OK' will not harm your system.

6. The following dialog box may appear, as shown below. Click the 'OK' button to continue.



This is a notification that if you are upgrading from a previous driver version, you should remove the associated Device Manager hardware entries and reinstall the adapter after the installing the SeaCOM software.

7. The setup file will automatically detect the operating environment and install the proper components. Next follow the information presented on the screens that follow. Once the installation is complete, close the disk installation window.
8. Refer to the Hardware Installation section to connect and install your adapter.

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.

Linux Support

The 7803ec is supported natively in Linux kernels 2.6.28 and later.



Do not connect the hardware until the software has been successfully installed. To install Sealevel software, you must log in as an administrator or have administrator privileges in Windows.



To install Sealevel software, you must log in as an administrator or have administrator privileges in Windows.

For additional software support, please call Sealevel Systems' Technical Support, (864) 843-4343. Our technical support is free and available from 8:00 AM - 5:00 PM Eastern Time, Monday through Friday. For email support contact: support@sealevel.com.

Hardware Installation



Do not install the PCI Express board until the software has been successfully installed

Once you have installed the software, install the 7803ec into an available PCI Express slot and boot the computer. The drivers that were installed during the software installation process will automatically be used to configure the adapter.



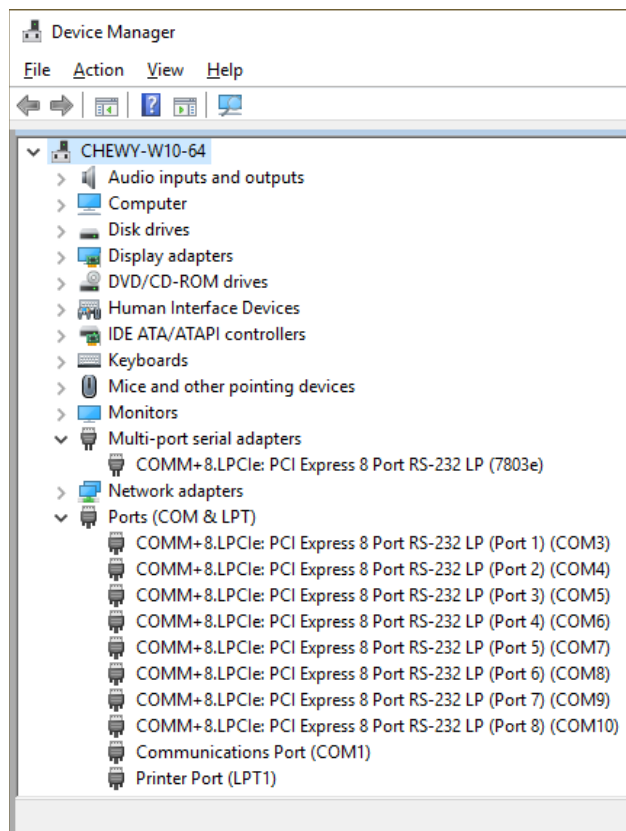
Once the hardware installation completes, you may need to restart the computer to finalize the installation process.

Verifying Installation

To confirm that the serial port has been successfully installed, look in Device Manager under 'Ports (COM & LPT)' and in parentheses should be a COM number assigned to each port number.



Your system will assign the next available COM number, which will vary by computer (COM3 through COM10 are shown in this example).



Uninstall Instructions

The SeaCOM software program adds entries to the system registry that are necessary for specifying the operating parameters for your device. To completely remove the hardware and associated software, follow the steps in the order they appear.



Start with the hardware installed in a PCI Express slot. Do not remove until instructed to do so.

Remove Hardware Using Device Manager

To access Device Manager, follow the steps below:

1. Open Windows Explorer
2. Right click on 'This PC' or 'Computer' icon.
3. Click 'Manage' in the fly out menu to launch the 'Computer Management' console window.
4. In the left pane under 'System Tools', click 'Device Manager'.
5. In right pane, expand the 'Multi-port serial adapters' section by double clicking it.
6. Locate the COMM+8.PCIe device in the listing.
7. Right click on the entry for the 'COMM+8.PCIe' device and click 'Uninstall'
8. Confirm that you want to uninstall the device by clicking the 'OK' button. This will remove the hardware, COM ports and all registry entries from your computer. Keep the device connected.
9. The window will refresh and the entry for the device will no longer appear. Proceed with removing the software via Windows Control Panel.

Remove Software Using Control Panel

1. Open Windows Explorer.
2. Type 'Control Panel' in the address bar and press enter.
3. Click 'Uninstall a program' under the 'Programs' icon.
4. Double click the 'SeaCOM' entry in the list.
5. Follow the dialog options to complete the uninstall.

If you want to completely remove the hardware and software from your computer, power down your computer, remove the device from the PCI Express slot, and then reboot your computer to complete the uninstallation.

Technical Description

The Sealevel Systems 7803ec provides a PCIe interface adapter with eight (8) asynchronous RS-232 serial ports for modems, printers, and plotters, as well as industrial automation and control applications.

The 7803ec provides UARTs with 256 byte TX and RX FIFOs, programmable baud rates, data format, and interrupt control.

Micro 68-pin Female Connector Pin Assignments

The 7803ec includes a Micro 68-pin female connector for attaching the included cable (Part Number CA202).

Pin#	RS-232	Pin#	RS-232	Pin#	RS-232	Pin#	RS-232
1	Port 1 TD (O)	18	GND	35	Port 5 TD (O)	52	GND
2	Port 1 RI (I)	19	Port 3 TD (O)	36	Port 5 RI (I)	53	Port 7 TD (O)
3	Port 1 DCD (I)	20	Port 3 RI (I)	37	Port 5 DCD (I)	54	Port 7 RI (I)
4	Port 1 DTR (O)	21	Port 3 DCD (I)	38	Port 5 DTR (O)	55	Port 7 DCD (I)
5	Port 1 RTS (O)	22	Port 3 DTR (O)	39	Port 5 RTS (O)	56	Port 7 DTR (O)
6	Port 1 DSR (I)	23	Port 3 RTS (O)	40	Port 5 DSR (I)	57	Port 7 RTS (O)
7	Port 1 RD (I)	24	Port 3 DSR (I)	41	Port 5 RD (I)	58	Port 7 DSR (I)
8	Port 1 CTS (I)	25	Port 3 RD (I)	42	Port 5 CTS (I)	59	Port 7 RD (I)
9	Port 2 TD (O)	26	Port 3 CTS (I)	43	Port 6 TD (O)	60	Port 7 CTS (I)
10	Port 2 RI (I)	27	Port 4 TD (O)	44	Port 6 RI (I)	61	Port 8 TD (O)
11	Port 2 DCD (I)	28	Port 4 RI (I)	45	Port 6 DCD (I)	62	Port 8 RI (I)
12	Port 2 DTR (O)	29	Port 4 DCD (I)	46	Port 6 DTR (O)	63	Port 8 DCD (I)
13	Port 2 RTS (O)	30	Port 4 DTR (O)	47	Port 6 RTS (O)	64	Port 8 DTR (O)
14	Port 2 DSR (I)	31	Port 4 RTS (O)	48	Port 6 DSR (I)	65	Port 8 RTS (O)
15	Port 2 RD (I)	32	Port 4 DSR (I)	49	Port 6 RD (I)	66	Port 8 DSR (I)
16	Port 2 CTS (I)	33	Port 4 RD (I)	50	Port 6 CTS (I)	67	Port 8 RD (I)
17	GND	34	Port 4 CTS (I)	51	GND	68	Port 8 CTS (I)

(I) = Input

(O) = Output

"N/C" = Not Connected (unused)

"-" = Reserved

DB25 Male Cable Pin Assignments

The 7803ec includes a cable (Part Number CA202) with a Micro 68-pin male connector terminating to eight DB25 male connectors.

Pin#	RS-232	Pin#	RS-232
1	N/C	14	N/C
2	TD (O)	15	N/C
3	RD (I)	16	N/C
4	RTS (O)	17	N/C
5	CTS (I)	18	N/C
6	DSR (I)	19	N/C
7	GND	20	DTR (O)
8	DCD (I)	21	N/C
9	N/C	22	RI (I)
10	N/C	23	N/C
11	N/C	24	N/C
12	N/C	25	N/C
13	N/C	N/A	N/A

(I) = Input

(O) = Output

"N/C" = Not Connected (unused)

"N/A" = Not Applicable



Please terminate any unused control signals. The most common way to do this in RS-232 mode is to connect RTS to CTS and RI. Also, connect DTR to DCD and DSR.

Technical Specifications

Environmental Specifications

Specification	Operating	Storage
Temperature Range	0° to 70° C (32° to 158° 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

MTBF (Telcordia SR-332 prediction method)

Mean Time Between Failure	TBD hours	At 25° C ambient
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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

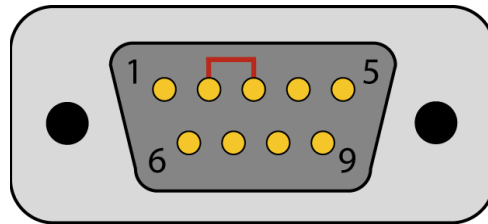
Typical Power Draw	TBD	
Supply voltage	+3.3 VDC	+12 VDC
Rating	TBD mA	TBD mA

Appendix A – Troubleshooting

Once you have confirmed that the serial adapter COM ports are listed in Device Manager, use the Sealevel WinSSD utility to verify communications. Detailed help is included in the WinSSD utility.

If you have a loopback plug, put it on the adapter connector. If you do not have a loopback plug, you can use female jumper wires to make the connection to verify the functionality.

RS-232 requires pins 2 (Receive) & 3 (Transmit) to be jumpered as shown in this graphic:

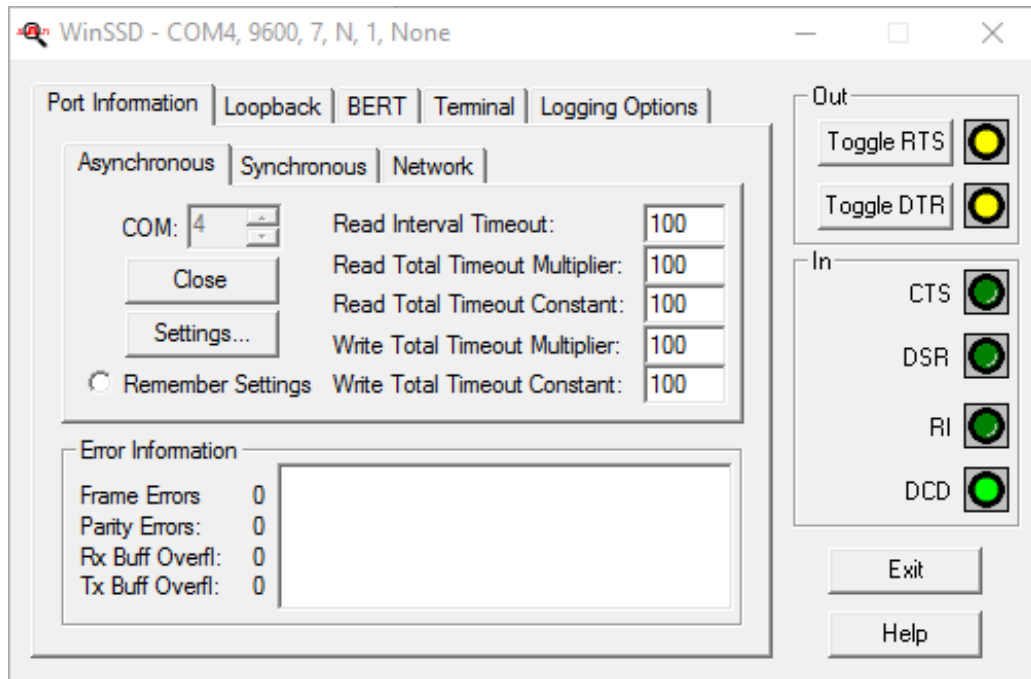


If you do not have a loopback plug or jumper wires handy, you can use a metal device such as a knife, screwdriver, key, or paperclip to short pins two and three.

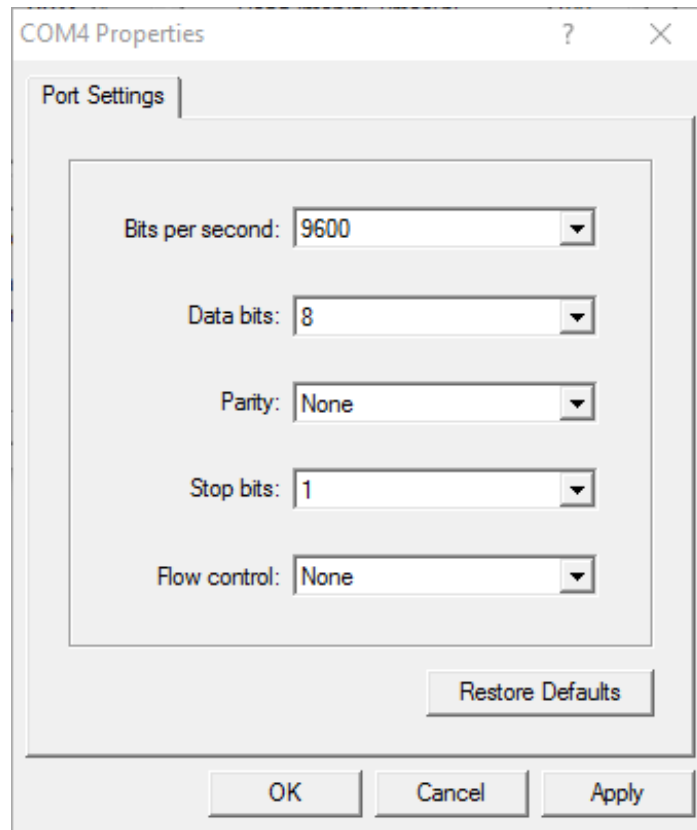
To test communications, launch the WinSSD utility in the SeaCOM folder in the 'Start' menu.

On the 'Port Information' tab, select the associated COM port and click the 'Open' button.

This will first open the COM port. From this tab the port can also be closed (See image below). Click the 'Settings' button to open the COM Port Properties dialog box. This will allow the Port Settings to be altered.



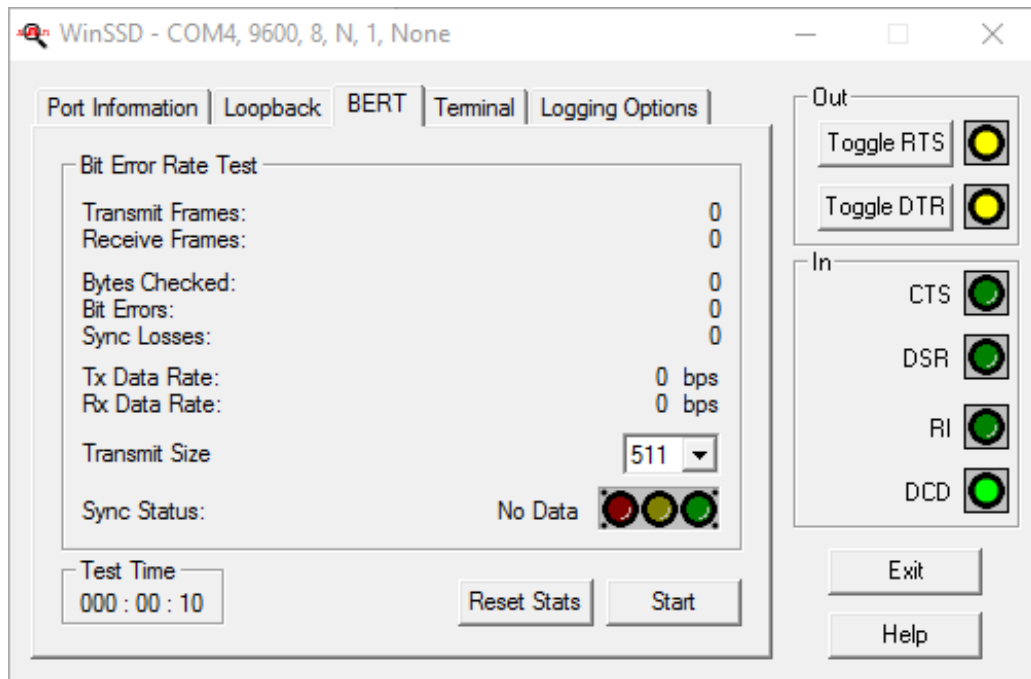
Change your parameters to 9600 bits per second, 8 data bits, no parity, 1 stop bit, and no flow control, as pictured below.



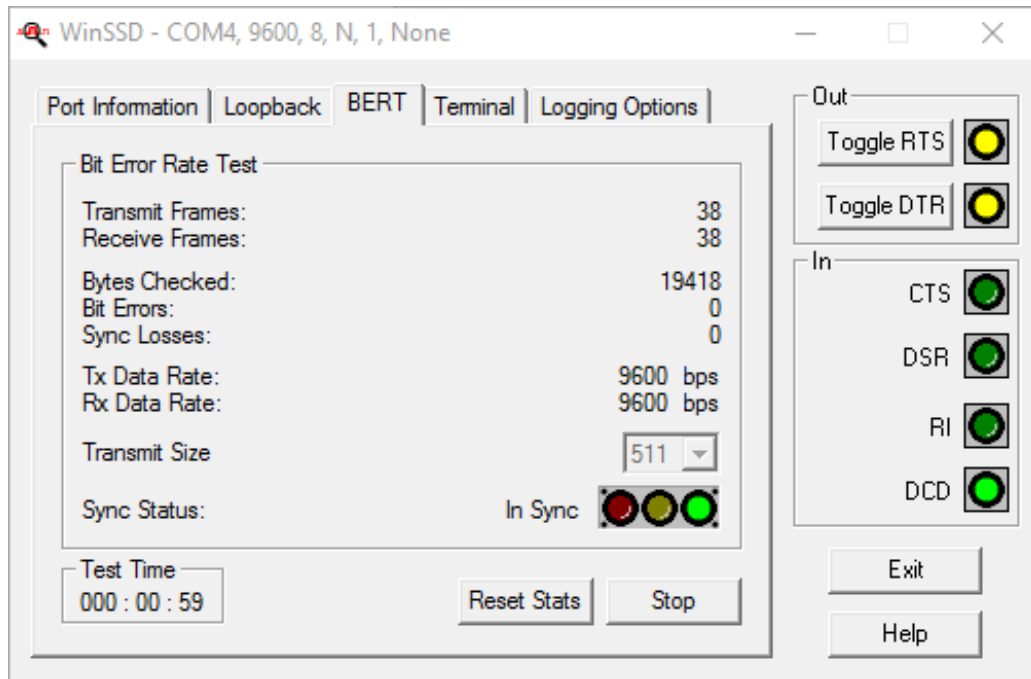
Click 'Apply' and 'OK'.

In the main WinSSD window, click on the 'BERT' tab (Bit Error Rate test).

Click on the 'Start' button.



If the COM port is properly working, the Sync Status green light will glow, and the Transmit Frames and Receive Frames will increase. The Tx and Rx Data Rates will show the calculated data rate.



This verifies that the adapter is working properly. You can continue testing this port with different configurations or proceed with testing other ports, if necessary.

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 A.M.- 5:00 P.M. Eastern Time Monday through Friday. For email support contact support@sealevel.com.

Appendix B – 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:

- Transport boards and cards in electrostatically secure containers or bags.
- Keep electrostatically sensitive components in their containers, until they arrive at an electrostatically protected workplace.
- Only touch electrostatically sensitive components when you are properly grounded.
- 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:

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

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-C/D/E or EIA/TIA-232-C/D/E. It is defined as “Interface between Data Terminal Equipment and Data Circuit-Terminating Equipment Employing Serial Binary Data Interchange”. The mechanical implementation of RS-232 is on a 25-pin D sub connector. 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 has 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 widespread use and will be referred to as RS-232 in this document. RS-232 is capable of operating at data rates up to 20K bps / 50 ft. The absolute maximum data rate may vary due to line conditions and cable lengths. RS-232 often operates at 38.4K bps over very short distances. The voltage levels defined by RS-232 range from -12 to +12 volts. 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. A voltage of +12 volts (usually +3 to +10 volts) represents a binary 0 (space) and -12 volts (-3 to -10 volts) denote a binary 1 (mark). 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 Sealevel Systems Adapter is a DTE interface.

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 Unil 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.

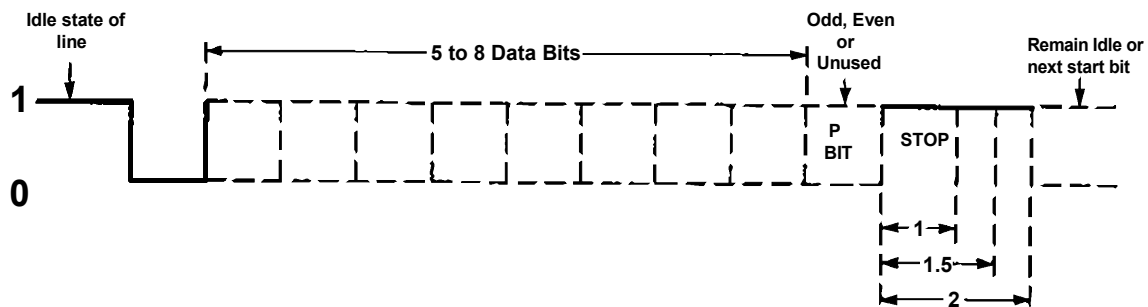
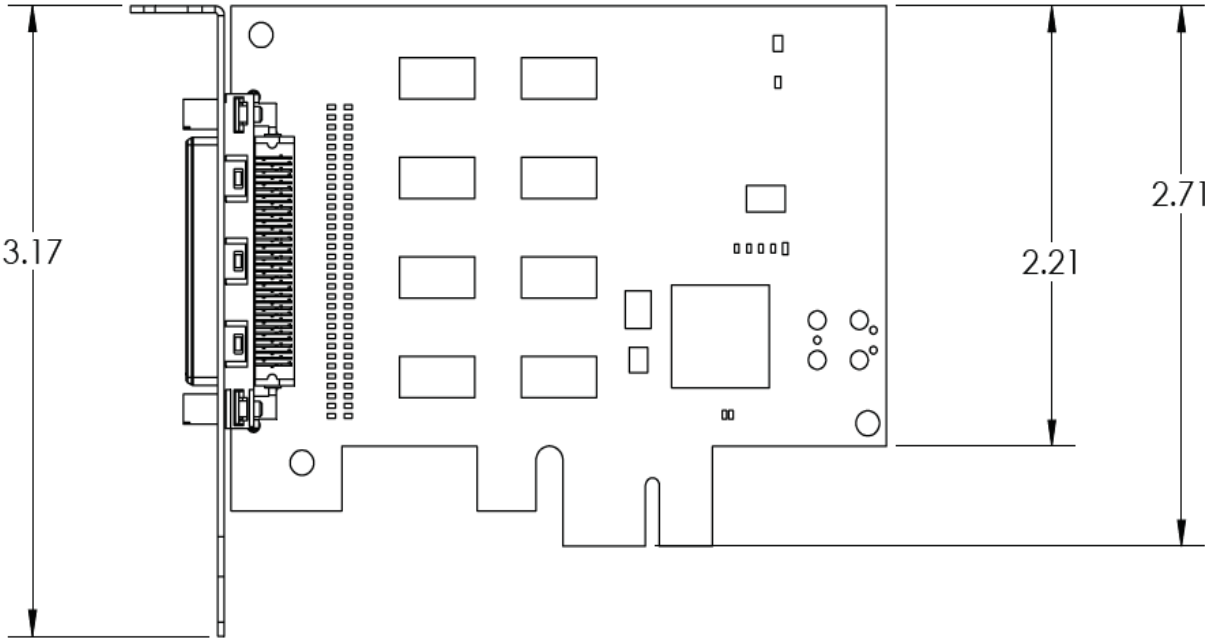
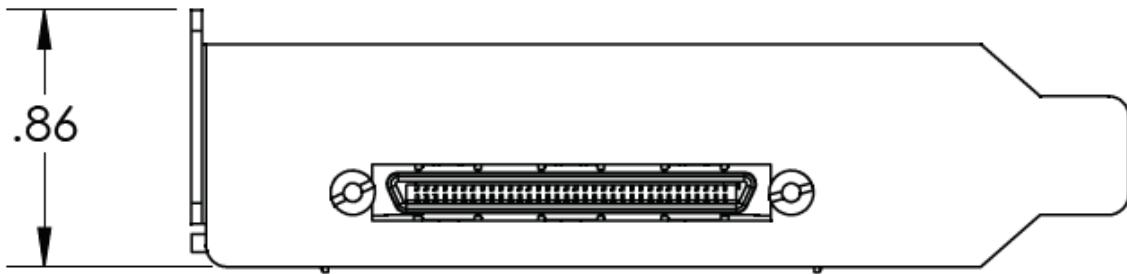
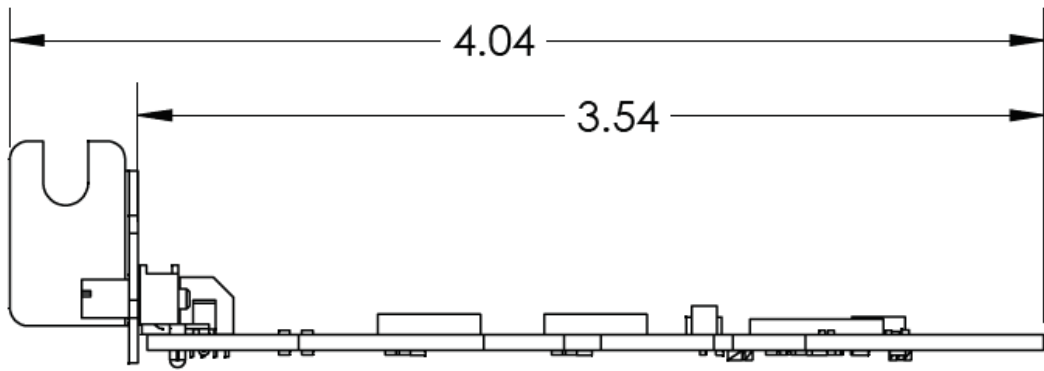


Figure 1 - Asynchronous Communications Bit Diagram

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 – Mechanical Drawing





Appendix F – Compliance Notices

Federal Communications Commission (FCC) Statement



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 user's 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".



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 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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