Manuals+ — User Manuals Simplified.

Sealevel USB to 48 Channel TTL Digital Interface Adapter User Manual

Contents

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Introduction

The SeaLINK PIO-48, part number 8203, provides an easy method for interfacing common digital I/O circuitry via any computer's USB port. Typical applications include control/monitoring of TTL devices (e.g., LEDs, small solenoids, small relays) and interfacing to solid-state relay racks (SSRs) for high-power AC or DC loads. The SeaLINK PIO-48's 48 digital I/O channels are accessed via two 50-pin header connectors with industry-standard pin out. Each header provides 24 bits of digital I/O divided into three eight-bit groups. Each eight-bit group may be individually configured via software command as input or output to best match your particular application requirements.

The SeaLINK PIO-48 is designed to be used under Windows 98/ME/2000/XP. The SeaI/O API (Application Programmer Interface) available on Sealevel's website provides a variety of useful high-level function calls implemented in a Windows dynamic link library (DLL). This API gives access to the SeaLINK PIO-48's I/O from Windows-based platforms such as Visual C++. In addition to the API, SeaI/O includes an ActiveX control along with sample code and utilities to simplify software development.

Other Sealevel SeaLINK USB to Digital I/O Products

Model No.	Part No.	Description
SeaLINK PIO-96	(P/N 8205)	– 96 TTL Inputs/Outputs
SeaLINK PLC-16	(P/N 8206)	– 8 Form C Outputs/ 8 Opto-isolated Inputs
SeaLINK REL-16	(P/N 8207)	– 16 Reed Relay Outputs
SeaLINK ISO-16	(P/N 8208)	– 16 Opto-isolated Inputs
SeaLINK DIO-16	(P/N 8209)	– 8 Reed Outputs/8 Opto-isolated Inputs

Before You Get Started

What's Included
The SeaLINK PIO-48 is shipped with the following items. If any of these items are missing or damaged, please contact Sealevel for replacement.

- SeaLINK PIO-48 Module
- AC/DC 5V Power Supply (Item# TR101)
- 6' USB A to B Cable (Item# CA179)

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 for interfacing the SeaLINK PIO-48 to real-world signals. All items can be purchased from our website (**http://www.sealevel.com**) or by calling (864) 843-4343.

For TTL Applications

- Terminal Block Kit – (Part Number KT107) Kit includes the TB07 screw terminal block and CA167 ribbon cable for connecting one of the SeaLINK PIO-48's 50-pin header connectors to your I/O. 6" Snap track and DIN rail clips are included for DIN rail mounting.
- IDC 50 to IDC 50 Pin 40″ Ribbon Cable (Part Number CA167) Interfaces each of the SeaLINK PIO-48's 50-pin header connectors.
- Simulation/debug module (Part Number TA01) Module allows monitoring status of output pins and controlling state of input pins. An LED corresponding to each port bit illuminates to indicate state. Eight position DIP-switches are used to generate input status changes.
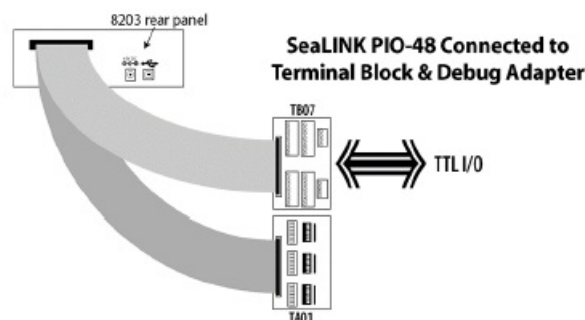
For High-Current, High-Voltage Applications

- IDC 50 to IDC 50 Pin Ribbon Cable (Part Number CA167) 40" cable connects the SeaLINK PIO-48 to solid-state relay racks equipped with 50-pin header interface.
- IDC 50 to IDC 50 Pin Ribbon Cable (Part Number CA135) 40" cable connects the SeaLINK PIO-48 to solid-state relay racks equipped with 50-pin edge connector.

Solid State Relay Racks:

- Quad six position relay rack (Part Number PB24HQ) Relay rack can accept up to six QSSRs for a total of 24 channels. Features a 50-pin header connector for easy interface via 50-conductor ribbon cables.
- Quad four position relay rack (Part Number PB16HQ) Relay rack can accept up to four QSSRs for a total of 16 channels. Features a 50-pin header connector for easy interface via 50-conductor ribbon cables.

Quad Solid State Relay Modules:

- **AC Input (Part Number IA5Q)**

  Provides 4 channels of discrete I/O interface to monitor AC inputs up to 140V @ 10mA.

- **DC Input (Part Number IB5Q)**

  Provides 4 channels of discrete I/O interface to monitor DC inputs from 3.3V to 32V.

- **AC Output (Part Number OA5Q)**

  Provides 4 channels of discrete I/O interface to control AC outputs up to 140V @ 3A.

- **DC Output (Part Number OB5Q)**

  Provides 4 channels of discrete I/O interface to control DC outputs up to 60V @ 3A.

Simulation/debug module (Part Number TA01)
Module simulates the operation and load characteristics of a standard 24-channel relay rack. An LED corresponding to each port bit illuminates to indicate state. Eight position DIP-switches are used to generate input status changes.
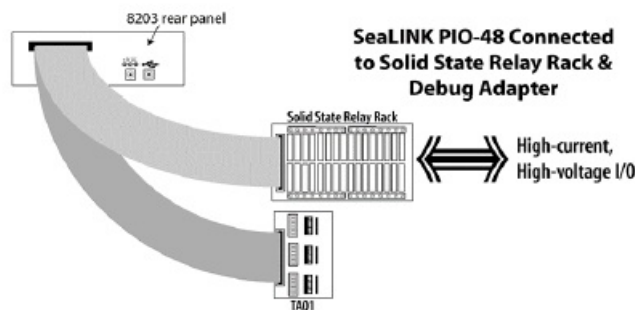
Software Installation

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 legacy 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 (#8203) for your adapter from the listing.
3. Select 'Download Now for SeaIO Classic for Windows'. The setup file will automatically detect the operating environment and install the proper components. Next (depending on your browser) select the 'Run this program from its current location' or 'Open' option. Follow the information presented on the screens that follow.
4. 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.
5. 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.
6. If installing in NT, skip to step 15. 'Windows NT Card Installation.'

7. Go to the "Add New Hardware Wizard" in the Control Panel.

8. When the Wizard asks if you want Windows to search for the new hardware, choose "No, I want to select the hardware from a list."

9. Scroll through the list of categorized hardware and select 'SeaIO Devices.' If this is the first SeaIO device you may need to select 'Other Devices' and 'Sealevel Systems, Inc.' instead of 'SeaIO Devices.'

10. Click "Next."

11. Select the card model and press "Next."

12. The Wizard will guide you through a few more informational prompts; continue to click "Next" until it is completed.

13. Your card's resource assignments may be adjusted through the Device Manager (if, for instance, you need to change the I/O port address Windows assigned when you installed the card).

14. Windows software installation is complete

15. Windows NT Card Installation: After accomplishing steps 1 – 5, bring up the Control Panel and double-click on the SeaIO Devices icon. To install a new card, click "Add Port." Repeat this procedure for as many SeaIO cards as you wish to install.

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**.

Physical Installation

The SeaLINK PIO-48 can be installed in any open USB port. Do not install the Adapter in the machine until the software has been fully installed.

1. Simply connect the SeaLINK PIO-48 to your USB port with the supplied cable.
2. The software drivers installed during setup will automatically recognize and configure the device.
3. You should see one or more "New Hardware Found" windows, indicating the actual device being created.
4. Next, view your system's Device Manager.
5. You should have a new 'SeaIO 8203' in the SeaI/O Device heading indicating the installation was successful.

The SeaLINK PIO-48 is now ready for use.

Digital I/O Interface

The SeaLINK PIO-48's 48 digital I/O channels are accessed via two industry-standard 50-pin header connectors. Each header provides 24 bits of digital I/O divided into three eight-bit ports. Each port may be individually configured via software command as input or output.

50-pin Header Connector
You will need to open the SeaLINK PIO-48's enclosure to access the two header connectors P2 and P3 (see Appendix C for connector locations). To open, remove the four screws found on the bottom panel of the unit. Once cables are connected to the headers reassemble the enclosure with the cables exiting the opening on the back panel of the unit. Each of the two 50-pin connectors has the following pin out which is compatible with a wide variety of solid state relay racks:

Connector P2

Connector P3
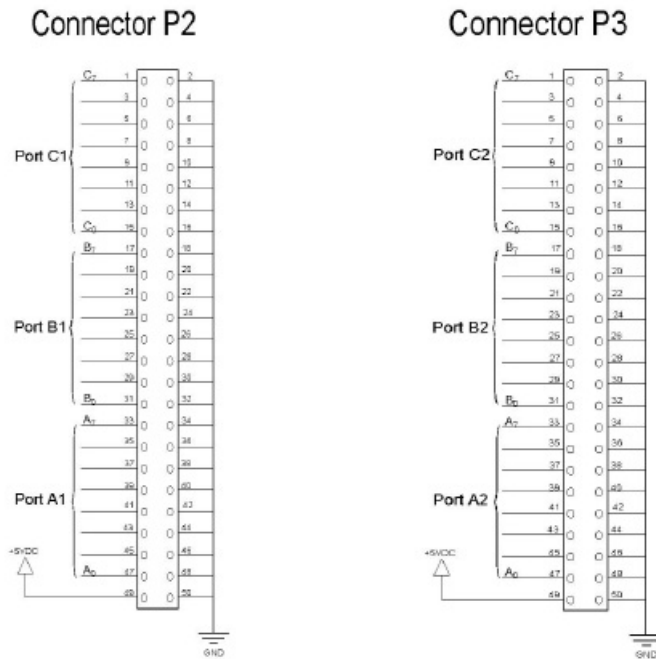
Programming the SeaLINK PIO-48

Sealevel's SeaI/O software is provided to assist in the development of reliable applications for the Sealevel Systems family of digital I/O adapters. Included in the SeaI/O software are driver functions for use in accessing the I/O as well as helpful samples and utilities.

Programming for Windows

The SeaI/O API (Application Programmer Interface) provides a variety of useful high-level function calls implemented in a Windows dynamic link library (DLL). The API is defined in the help file (Start/Programs/SeaIO/SeaIO Help) under "Application Programmers Interface". This help file also includes detailed information dealing with installation / removal of the software and information about latency, logic states, and device configuration.

For C language programmers we recommend using the API to access the SeaLINK PIO-48. If you are programming in Visual Basic, using the ActiveX control included with SeaI/O is advised.

Samples and Utilities

A variety of sample programs and utilities (both executable and source code) are included with SeaI/O. Further documentation on these samples can be found by selecting "Start/Programs/SeaIO/Sample Application Description". Information about where the files are physically stored on your disk is also included in this same file.
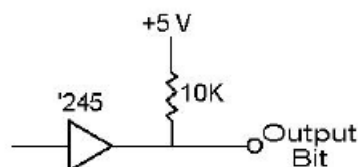
Electrical Characteristics

The SeaLINK PIO-48 uses 74ABT245 octal bi-directional transceivers to provide TTL input/output capabilities. Each bit is pulled to +5V through a 10K ohm pull-up resistor to insure each bit is at a known state when not driven.

Input Circuit Schematic
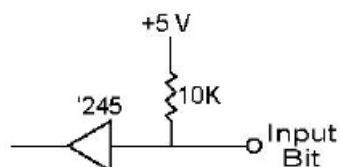
Output Circuit Schematic

Specifications

Inputs

Logic High	Min 2VDC
Logic Low	Max 0.8VDC

Outputs

Logic High	Min 2VDC @ 32 mA
Logic Low	Max 0.5VDC @ 64 mA

Temperature Range

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

Power Consumption

Supply line	+5 VDC	+5VDC
Rating	400 mA (no load)	2.4A (Max)

Example Circuits

TTL Input

TTL Output

Solid State Relay Input

Solid State Relay Output
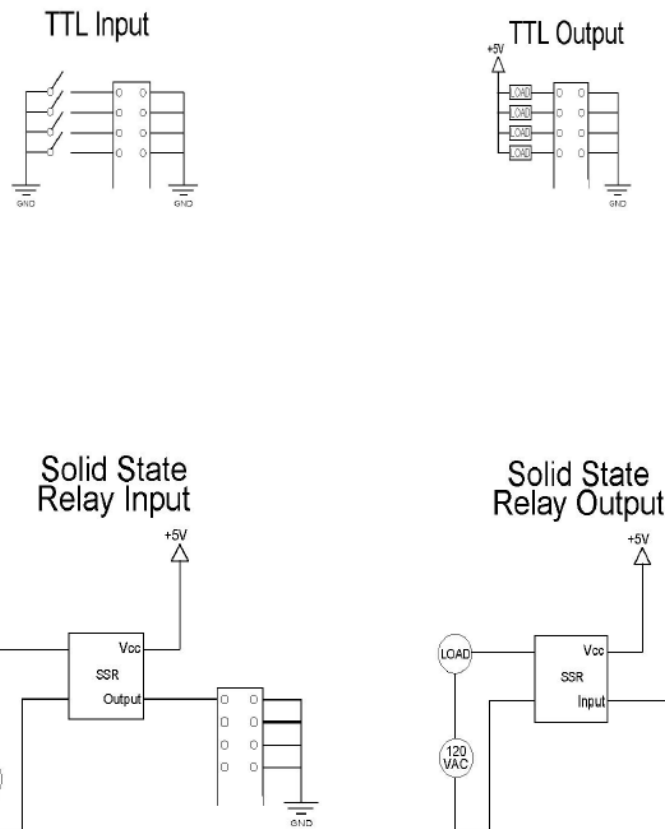
Appendix A – Troubleshooting

The adapter should provide years of trouble-free service. However, in the event that device appears to not be functioning incorrectly, the following tips can eliminate most common problems without the need to call Technical Support.

1. Read this manual thoroughly before attempting to install the adapter in your system.
2. Use Device Manager under Windows to verify proper installation.
3. Use the SeaI/O control panel applet for card identification and configuration.
4. Identify all I/O adapters currently installed in your system. This includes your on-board serial ports, controller cards, sound cards etc. The I/O addresses used by these adapters, as well as the IRQ (if any) should be identified.
5. Configure your Sealevel Systems adapter so that there is no conflict with currently installed adapters. No two adapters can occupy the same I/O address.
6. Make sure the Sealevel Systems adapter is using a unique IRQ The IRQ is typically selected via an on-board header block. Refer to the section on Card Setup for help in choosing an I/O address and IRQ.
7. Make sure the Sealevel Systems adapter is securely installed in a motherboard slot.
8. If you are utilizing an operating system prior to Windows 7, please contact Sealevel's Technical support as directed below to receive more information regarding the utility software which will determine if your product is functioning properly.
9. Only users running Windows 7 or newer should utilize the diagnostic tool 'WinSSD' installed in the SeaCOM folder on the Start Menu during the setup process. First find the ports using the Device Manager, then use 'WinSSD' to verify that the ports are functional.
10. Always use the Sealevel Systems diagnostic software when troubleshooting a problem. This will help eliminate any software issues and identify any hardware conflicts.

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 – How To Get Assistance

Please refer to Troubleshooting Guide prior to calling Technical Support.

1. Begin by reading through the Trouble Shooting Guide in Appendix A. If assistance is still needed please see below.
2. When calling for technical assistance, please have your user manual and current adapter settings. If possible, please have the adapter installed in a computer ready to run diagnostics.
3. Sealevel Systems provides an FAQ section on its web site. Please refer to this to answer many common questions. This section can be found at **http://www.sealevel.com/faq.asp**.
4. Sealevel Systems maintains a web page on the Internet. Our home page address is **https://www.sealevel.com/**. The latest software updates, and newest manuals are available via our web site.
5. Technical support is available Monday to Friday from 8:00 A.M. to 5:00 P.M. Eastern Time. Technical support can be reached at (864) 843-4343.

RETURN AUTHORIZATION MUST BE OBTAINED FROM SEALEVEL SYSTEMS BEFORE RETURNED MERCHANDISE WILL BE ACCEPTED. AUTHORIZATION CAN BE OBTAINED BY CALLING SEALEVEL SYSTEMS AND REQUESTING A RETURN MERCHANDISE AUTHORIZATION (RMA) NUMBER.

Appendix C – Silk Screen – 8203 PCB
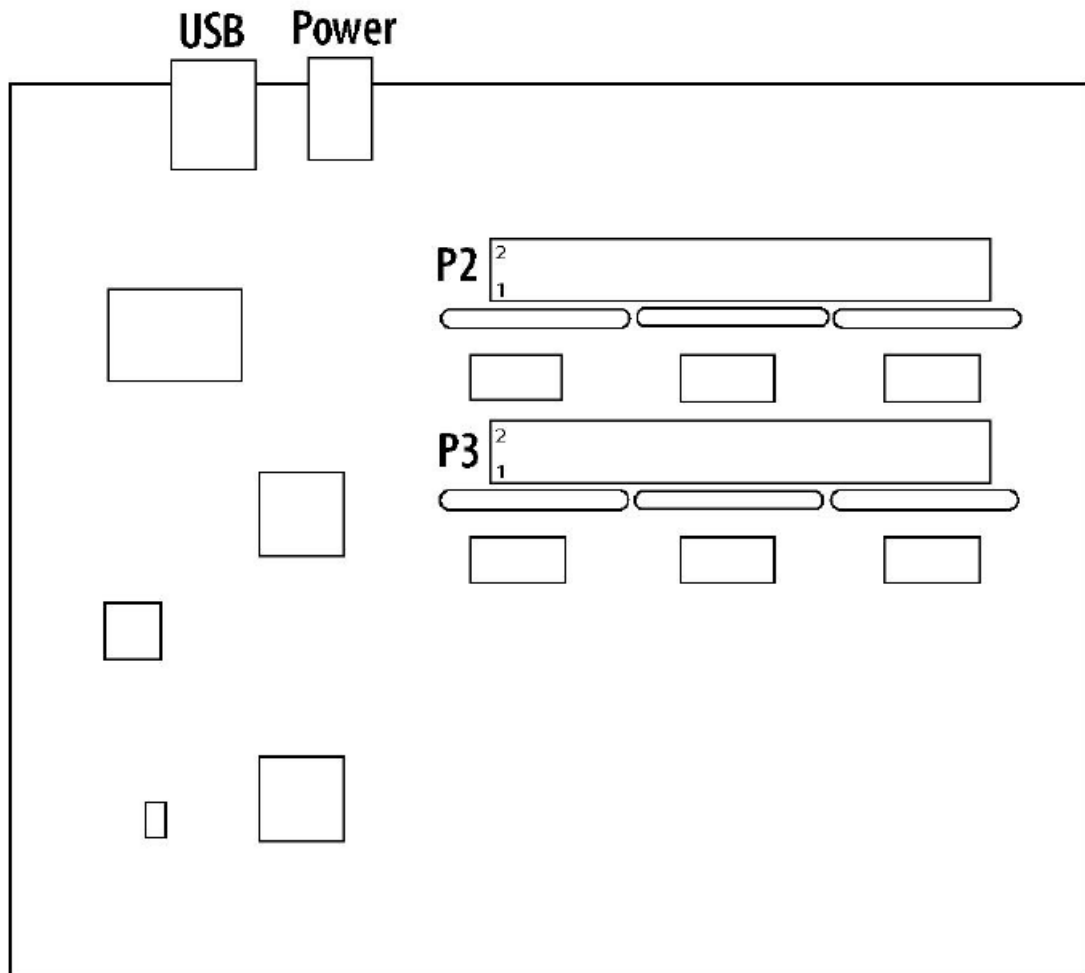
Appendix D – Compliance Notices

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 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".

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

Sealevel Systems, Incorporated acknowledges that all trademarks referenced in this manual are the service mark, trademark, or registered trademark of the respective company.

Documents / Resources

Sealevel USB to 48 Channel TTL Digital Interface Adapter [pdf] User Manual
TTL Digital Interface Adapter, USB to 48 Channel, Interface Adapter, Adapter

References

- **Sealevel - I/O & Computing Products, Engineering and Manufacturing**
- **Sealevel - I/O & Computing Products, Engineering and Manufacturing**

- ⯑ **[FAQs - Sealevel](#)**
- ⯑ **[Sealevel - I/O & Computing Products, Engineering and Manufacturing](#)**
- ⯑ **[Software Driver Search - Sealevel](#)**
- ⯑ **[WinSSD Software Utility Overview - Sealevel](#)**

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