

SeaI/O-270U Manual



**Isolated 7-Port USB Hub
with SeaLATCH™ Ports**



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Introduction

The SeaI/O-270U is an optically isolated 7-port USB hub that protects the host computer from spikes, surges and ground loops commonly found in industrial environments. The hub is powered by an industrial grade wall-mount power supply providing a full 500mA to each attached USB peripheral. The SeaI/O-270U is ideal for adding USB ports to a SeaPAC touchscreen HMI system, a Relio R1000 embedded solid-state industrial computer, or a SeaI/O data acquisition “stack”.

The SeaI/O-270 integrates patent-pending SeaLATCH USB ports, which are fully compatible with standard USB cables. When used with the included USB cable with a SeaLATCH type B USB connector, the metal thumbscrew provides a secure metal-to-metal connection to the hub and prevents accidental cable disconnection. The hub’s seven SeaLATCH type A USB connectors can secure USB peripherals to the hub in the same way. Additionally, a highly-retentive type B USB connector helps prevent unintentional separation from a standard USB cable.

Features

- Provides 1500 VAC isolation on upstream USB port
- Includes 7 USB downstream ports with 500mA available per port
- Patent-pending SeaLATCH USB connectors provide locking connection
- Native support in Windows 98SE/ME/2000/XP/Vista™, and Linux kernel v2.4 operating systems
- Status LEDs indicate external power, connection to host, and fault condition
- High-retention USB type “B” connector prevents accidental disconnection of standard USB cable



Before You Get Started

What's Included

The SeaI/O-270U is shipped with the following items. If any of these items is missing or damaged please contact Sealevel for replacement.

- **SeaI/O-270U** – SeaI/O 7-Port Isolated USB Hub
- **CA356** – USB Type A to SeaLATCH USB Type B Cable, 6' in Length
- **TR122** – 12VDC @ 2A Wall-Mount Power Supply
- **Sealevel Software CD** – Manual Only

Optional Items

Depending upon your application, you are likely to find one or more of the following items useful with the SeaI/O-270U. All items can be purchased from our website (<http://www.sealevel.com/>) or by calling 864-843-4343.

- **SeaLATCH USB Type A and Type B Device Cable, 72" (Item# CA332)**
The CA332 is a USB device cable with patent-pending SeaLATCH USB type A and type B connectors. The metal thumbscrew on each connector provides a secure metal-to-metal connection to devices with SeaLATCH USB ports.
- **SeaLATCH USB Type A to USB Type B Device Cable, 72" (Item# CA355)**
The CA355 is a USB device cable with a patent-pending SeaLATCH USB type A connector and standard type B connector. This cable secures the SeaI/O-270U to legacy USB peripheral devices.
- **USB Type A to SeaLATCH Type B Device Cable, 72" (Item# CA356)**
The CA356 is a USB device cable with a patent-pending SeaLATCH USB type B connector and standard type A connector. This cable is included with all Sealevel USB products with an integrated SeaLATCH type B USB port.
- **USB Type A to USB Type A, 3 Meter Extension Cable (Item# CA214)**
The CA214 is a fully rated USB extension cable that adds three meters to any existing USB cable (maximum 5 meters). The CA214 has a Type A male connector on one end and a Type A female connector on the other end.
- **USB Type A to USB Type B, 3 Meter Device Cable (Item# CA179)**
The CA179 is a standard 3 meter device cable that connects USB peripherals with a Type B connector to the Type A connector on a host PC or hub.
- **USB Type A to USB Type B, 5 Meter Device Cable (Item# CA215)**
The CA215 is a fully rated 5 meter device cable that connects USB peripherals with a Type B connector to the Type A connector on a host PC or hub. This cable provides the maximum 5 meters (16 feet) for a USB connection.

Installation

Windows 98/ME/2000/XP/Vista™ Operating Systems

1. The SeaI/O-270U is fully supported as a generic USB hub device in Windows 98/ME/2000/XP/Vista™ operating systems and requires no separate driver. The Sealevel Software CD is included only for distribution of the user manual and other literature.
2. Simply connect the included wall-mount power supply to the SeaI/O-270U and connect to an AC outlet.
3. Using the included SeaLATCH USB device cable, plug the SeaI/O-270U into an available USB port on your host system.
4. The 'Found New Hardware' screen will appear and the hub will be automatically recognized as a generic USB hub device.
5. The hub is ready to use when you see the screen 'Your USB hub is installed and ready to use.'

NOTE:



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

Linux Support

USB devices are supported in Linux kernel v2.4 or better. Refer to the help files included with your Linux distribution for specific instructions on adding generic USB hub devices.

Hardware Description

Optical Isolation

The Sea/O-270U is an optically isolated USB hub that connects up to seven USB peripherals while protecting the host computer from voltages up to 1500 VAC.

This protects the host computer from potentially damaging voltage spikes, power surges, and ground loops commonly found in industrial and OEM applications.



USB Ports

The Sea/O-270U integrates patent-pending SeaLATCH USB ports, which are fully compatible with standard USB cables. When used with the included USB cable with a SeaLATCH type B USB connector, the metal thumbscrew provides a secure metal-to-metal connection to the hub and prevents accidental cable disconnection.

Additionally, a highly-retentive type B USB connector helps prevent unintentional separation from a standard USB cable. The SeaLATCH type B locking connector and high retention type B port are shown below.



The hub's seven SeaLATCH type A locking USB connectors can secure USB peripherals to the hub in the same way. Two of the SeaLATCH type A USB ports are shown below. Each of the seven downstream type A USB ports provides a full 500mA to USB peripherals.



Status LEDs

Status LEDs are also included on the front of the SeaI/O-270U module to indicate the following information:

- ENABLE (Yellow) – Lights when the USB hub is enumerated by the host system.
- FAULT (Red) – Lights when there is a problem with a downstream USB port. Disconnect the downstream devices one at a time until the status returns to normal.
- EXT POWER (Green) – Indicates the external power supply is properly connected to the hub and an AC power source.



External Power

The SeaI/O-270U includes an industrial grade wall-mount power supply (Item# TR122) that outputs 12VDC @ 2A. Power is input via a 5mm 2-position removable screw terminal block (shown below). To prevent accidental disruption of power, the terminal block includes mounting screws for securing to the hub.

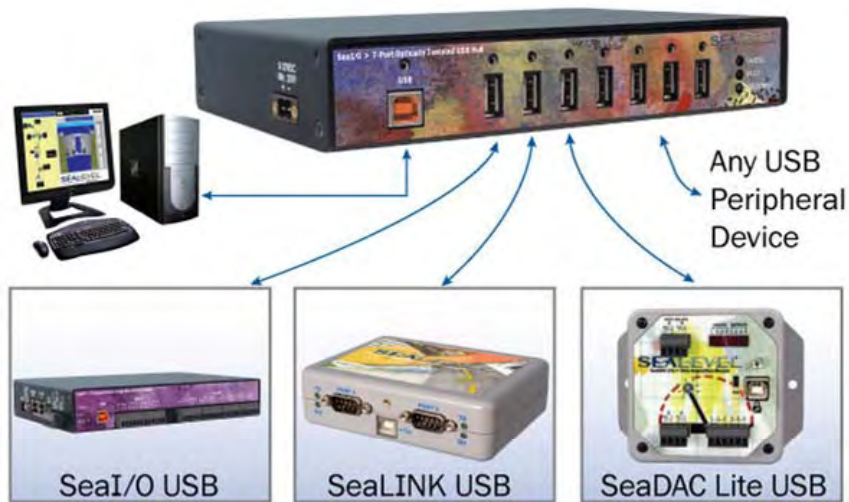


SeaLATCH™ USB

The SeaI/O-270 integrates patent-pending SeaLATCH USB ports, which are fully compatible with standard USB cables. When used with the included USB cable (Item# CA356) with a SeaLATCH USB type B connector, the metal thumbscrew provides a secure metal-to-metal connection to the hub and prevents accidental cable disconnection.

The hub's seven SeaLATCH type A USB connectors can secure USB peripherals to the hub in the same way. Sealevel incorporates SeaLATCH locking USB ports on many USB I/O devices. Accidental cable disconnection is the most common point of failure with USB industrial I/O devices and SeaLATCH cables and connectors prevents that while being fully compatible with standard USB cables.

Examples of the SeaI/O-270U with SeaLATCH equipped Sealevel I/O devices are shown below.



SeaLATCH Locking USB Cables

SeaLATCH USB Connectors

SeaLATCH locking USB cables integrate a small thumbscrew into each USB connector. SeaLATCH USB cables are fully interchangeable with standard USB cables. The thumbscrew provides a secure metal-to-metal connection preventing accidental disconnection. SeaLATCH USB cables are available in three configurations.



Item# CA356

The CA356 is a 72" USB cable with a SeaLATCH type B connector and a standard USB type A connector. This cable provides a secure connection between Sealevel products with a SeaLATCH type B port and legacy USB type A ports. The CA356 is included with Sealevel devices with a SeaLATCH type B port.



Item# CA332

The CA332 is a 72" cable with both SeaLATCH type A and B connectors. This cable secures both ends of the cable to devices with SeaLATCH USB ports and offers complete protection against accidental cable disconnection.



Item# CA355

The CA355 is a 72" cable with a standard USB type B and a SeaLATCH type A connector. This cable provides a secure connection between legacy USB devices and Sealevel products with a SeaLATCH type A port, such as the isolated USB hub (Item# 270U).



Mounting Options

SeaI/O Mounting Kit

The SeaI/O-270U is ideal for adding USB ports to a Relio R1000 embedded solid-state industrial computer (as shown), SeaPAC touchscreen HMI system, or a SeaI/O data acquisition “stack”. The SeaI/O-270U ships with an expansion kit that includes four metal straps and four #4-40 metal screws.



DIN Rail Mounting

The SeaI/O-270U is available with a factory-installed DIN-rail mounting clip. Alternatively DIN-rail mounting clips can be ordered as a field upgrade kit (Item# **DR104**). The bracket with clip is easily attached using two included #4-40 Phillips head machine screws.



Table/Wall Mounting

The flush mount bracket kit (Item# **KT123**) is extremely versatile and can be used to mount the SeaI/O-270U from the top, bottom, or back edge. The hub alone or with a stack of SeaI/O modules can be mounted flat to a tabletop, underneath a counter, or inside an enclosure. The kit can be used to mount the hub flat to a wall, or along the back edge, similar to DIN-rail mounting options.



Universal Mounting Bracket

The universal mounting bracket (Item# **KT125**) can be used as a “backpack” to other USB peripheral devices to the SeaI/O-270U. The universal arrangement of slots and holes accept bolt sizes to M4 and can be used for virtually any mounting configuration. The bracket also has holes for both 75mm and 100mm VESA mounting options.



Technical Specifications

Power Requirements

+9-30 VDC @ 20W (Minimum)

Dimensions

L	W	H
7.5"	5.1"	1.3"
19.05cm	12.95cm	3.30cm

Environmental Specifications

Specification	Operating	Storage
Temperature Range	0°C – 70°C (32°F – 158°F)	-50°C – 105°C (-58°F – 221°F)
Humidity Range	10 to 90% R.H. Non-Condensing	10 to 90% R.H. Non-Condensing

Manufacturing

All Sealevel Systems Printed Circuit boards are built to UL 94V0 rating and are 100% electrically tested. These printed circuit boards are solder mask over bare copper or solder mask over tin nickel.

Appendix A - Troubleshooting

The Seal/O-270U is a generic USB hub and should provide years of trouble-free service. Should the device appear to not be functioning correctly, the following tips can eliminate most common problems without the need to call Technical Support.

1. Make sure the power supply is connected to the hub and to a live AC power outlet. The green LED on the front of the unit will be lit, indicating the hub is properly powered. Inspect the power supply or call for a replacement if the green LED does not light after connecting to power.
2. Make sure the hub is connected to a USB port using the included USB cable or quality replacement USB cable. The yellow LED will be lit when the hub is properly enumerated by the operating system.
3. The hub is supported in any USB aware operating system that supports generic USB hub devices, including Windows 98/ME/2000/XP/Vista™ operating systems and Linux (kernel v2.4 or better). 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 Device Manager in Windows.
4. If the red LED lights, there is a fault condition with one of the downstream USB ports. Disconnect your USB peripherals until the red LED goes out. Inspect the problem USB peripheral and replace, if necessary. Try switching another USB peripheral to the problem port. If the red LED lights on the same port with a different USB device, contact technical support for further assistance.

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 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 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.

Appendix D - 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.

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

Trademarks

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