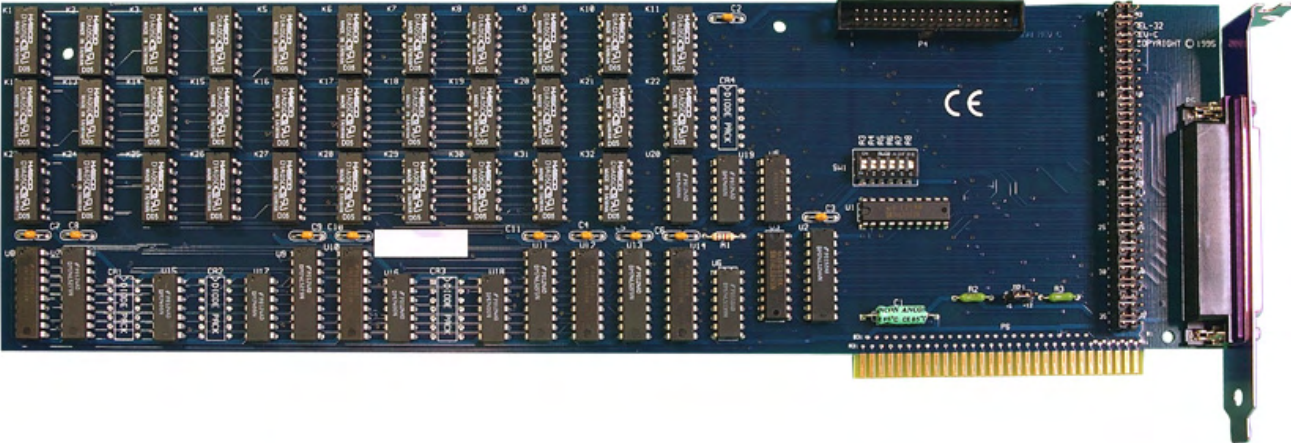


REL-32 User Manual



Part Number 3098



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Introduction

The REL-32 provides 32 reed relays that can switch power, data or other electronic signals for control applications. The outputs provide high quality, long life, low current (10 Watt maximum), dry contact switch closures. Reed relays are well suited for low current applications. The relays are normally open, and will close when energized.

The REL-32 is designed to be used with a variety of Operating Systems including Windows 98/NT/ME/2000/XP, Linux and DOS. The SeaI/O API (Application Programmer Interface) included on CD with the REL-32 provides a variety of useful high-level function calls implemented as a Windows dynamic link library (DLL) and as a Linux kernel module and library. In addition to the API, SeaI/O includes sample code and utilities to simplify software development.

Other Sealevel ISA Digital I/O Products

| | | |
|---------|------------|---|
| DIO-16 | (P/N 3096) | - 8 Reed Relay Outputs / 8 Opto-Isolated Inputs |
| ISO-16 | (P/N 3094) | - 16 Optically Isolated Inputs |
| REL-16 | (P/N 3095) | - 16 Reed Relay Outputs |
| DIO-32B | (P/N 3093) | - 16 Reed Relay Outputs / 16 Opto-Isolated Inputs |
| PIO-48 | (P/N 4030) | - 48 TTL Inputs/Outputs |

Before You Get Started

What's Included

The REL-32 is shipped with the following items. If any of these items is missing or damaged please contact Sealevel for replacement.

- **REL-32 Adapter**
- **CA172 6' DB78M to dual DB37M Cable**
- **Sealevel Sea/I/O Software CD**

Optional Items

Depending upon your application, you are likely to find one or more of the following items useful for interfacing the REL-32 to real-world signals. All items can be purchased from our website (<http://www.sealevel.com>) or by calling (864) 843-4343.

- **DB-37 Male to DB-37 Female 6' Cable (Part Number CA112)**
 - This cable extends the DB-37 connector on the CA172 cable an additional six feet and is pinned one-to-one.
- **DB-37 Male/Female Terminal Block (Part Number TB02-KT)**
 - Break out serial and digital connectors to 37 screw terminals for easy field connection. The TB02 terminal block is designed with both DB-37 male and female connectors, therefore; it can be used with any DB-37 board regardless of the board's port gender.
- **Cable and Terminal Block Kit (Part Number KT101)**
 - For convenient and easier ordering, the KT101 includes the TB02-KT terminal block and CA112 cable in a single kit.

Card Setup

The REL-32 contains several jumper straps for each port that must be set for proper operation.

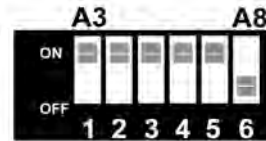
Address Selection

The REL-32 occupies 4 consecutive I/O locations. The DIP-switch (SW1) is used to set the base address for these locations. Be careful when selecting the base address as some selections conflict with existing PC ports. The following table shows several examples that usually do not cause a conflict.

| Address | Binary | Switch Settings | | | | | |
|---------|--------|-----------------|-----|-----|-----|-----|----|
| | | 1 | 2 | 3 | 4 | 5 | 6 |
| 280-283 | 000010 | Off | On | Off | On | On | On |
| 288-28A | 100010 | Off | On | Off | On | Off | On |
| 2A0-2A3 | 010100 | Off | On | Off | Off | Off | On |
| 328-32B | 100101 | Off | Off | On | On | On | On |
| 330-333 | 100110 | Off | Off | On | On | Off | On |

Address Selection Table

The following illustration shows the correlation between the DIP-switch setting and the address bits used to determine the base address. In the example below, address 300 is selected as the base address. Address 300 in binary is XXX 100000 XXX where X = a non-selectable address bit and address bit A9 is always a 1.



DIP-Switch Illustration

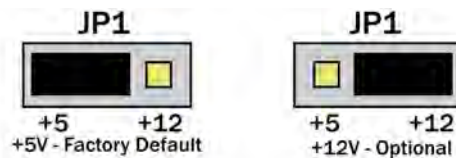
Note: Setting the switch 'On' or 'Closed' corresponds to a '0' in the address, while leaving it 'Off' or 'Open' corresponds to a '1'.

Options Header

| P1 | Function | P2 | Function | P3 | Function |
|----|------------|----|----------|----|------------|
| 1 | Switch 1B | 1 | Common 1 | 1 | Switch 1A |
| 2 | Switch 2B | 2 | Common 1 | 2 | Switch 2A |
| 3 | Switch 3B | 3 | Common 1 | 3 | Switch 3A |
| 4 | Switch 4B | 4 | Common 1 | 4 | Switch 4A |
| 5 | Switch 5B | 5 | Common 1 | 5 | Switch 5A |
| 6 | Switch 6B | 6 | Common 1 | 6 | Switch 6A |
| 7 | Switch 7B | 7 | Common 1 | 7 | Switch 7A |
| 8 | Switch 8B | 8 | Common 1 | 8 | Switch 8A |
| 9 | Switch 9B | 9 | Common 2 | 9 | Switch 9A |
| 10 | Switch 10B | 10 | Common 2 | 10 | Switch 10A |
| 11 | Switch 11B | 11 | Common 2 | 11 | Switch 11A |
| 12 | Switch 12B | 12 | Common 2 | 12 | Switch 12A |
| 13 | Switch 13B | 13 | Common 2 | 13 | Switch 13A |
| 14 | Switch 14B | 14 | Common 2 | 14 | Switch 14A |
| 15 | Switch 15B | 15 | Common 2 | 15 | Switch 15A |
| 16 | Switch 16B | 16 | Common 2 | 16 | Switch 16A |
| 17 | Switch 17B | 17 | Common 3 | 17 | Switch 17A |
| 18 | Switch 18B | 18 | Common 3 | 18 | Switch 18A |
| 19 | Switch 19B | 19 | Common 3 | 19 | Switch 19A |
| 20 | Switch 20B | 20 | Common 3 | 20 | Switch 20A |
| 21 | Switch 21B | 21 | Common 3 | 21 | Switch 21A |
| 22 | Switch 22B | 22 | Common 3 | 22 | Switch 22A |
| 23 | Switch 23B | 23 | Common 3 | 23 | Switch 23A |
| 24 | Switch 24B | 24 | Common 3 | 24 | Switch 24A |
| 25 | Switch 25B | 25 | Common 4 | 25 | Switch 25A |
| 26 | Switch 26B | 26 | Common 4 | 26 | Switch 26A |
| 27 | Switch 27B | 27 | Common 4 | 27 | Switch 27A |
| 28 | Switch 28B | 28 | Common 4 | 28 | Switch 28A |
| 29 | Switch 29B | 29 | Common 4 | 29 | Switch 29A |
| 30 | Switch 30B | 30 | Common 4 | 30 | Switch 30A |
| 31 | Switch 31B | 31 | Common 4 | 31 | Switch 31A |
| 32 | Switch 32B | 32 | Common 4 | 32 | Switch 32A |
| 33 | GND | 33 | Common 1 | 33 | 5V/12V |
| 34 | GND | 34 | Common 2 | 34 | 5V/12V |
| 35 | GND | 35 | Common 3 | 35 | 5V/12V |
| 36 | GND | 36 | Common 4 | 36 | 5V/12V |

Header JP1

Header JP1 provides a means of connecting +5 VDC and +12 VDC from the PC bus, to the Options Header. The center pin of this header is connected to P3 pins 33-36.



IRQ Header E2

Optional Cable Connector P4

Discrete access to both sides of all relays is provided by attaching the optional cable (CA-108) to pin header P4 with the colored edge of the ribbon cable attached to pin one. Removing all the jumpers connecting row P1 to P2 places the A-side of each relay at the on-board DB-37 and the B-side at the optional cable's DB-37.

Software Installation

Windows 98/ME/NT/2000/XP Installation

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

1. Start Windows.
2. Insert the Sealevel Systems CD in to your CD drive.
3. If 'Auto-Start' is enabled for this drive the software will automatically launch. Otherwise, point your browser to the 'Index.htm' on the root directory of the CD
4. Select 'Install Software'.
5. Select the Part Number for your adapter from the listing.
6. Select 'Windows 98/ME/NT/2000/XP'. 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.
7. A screen may appear with the declaration: "The publisher cannot be determined due to the problems below: Authenticode signature not found." Please select the 'Yes' button and proceed with the installation. This declaration simply means that the Operating System is not aware of the driver being loaded. It will not cause any harm to your system.
8. During setup the user may specify installation directories and other preferred configurations. This program also adds entries to the system registry that are necessary for specifying the operating parameters for each driver. An uninstall option is also included to remove all registry/INI file entries from the system.

Windows NT Card Installation: After accomplishing the above steps, 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.

Linux Installation

Note: You MUST have "root" privileges to install the software and drivers.

1. Login as "root".
2. Mount the CDROM by typing:

```
mount -t iso4860 /dev/hdc /cdrom
```

Note Your cdrom may not be /dev/hdc it could be /dev/hda, /dev/hdb, /dev/hdd, or if you have a SCSI drive /dev/sda, /dev/sdb, /dev/sdc, etc. You may mount the CDROM to any location, the /cdrom is just a common example.

3. Next change to the directory where you mounted the CDROM:

```
Ex. cd /cdrom/software/SeaIO/Other/linux
```

Note: The syntax is case sensitive.

4. Copy seaio .tar.gz to your home directory by typing:

```
cp seaio .tar.gz ~
```

5. Change to your home directory by typing:

```
cd
```

6. Unmount the drive and then Unzip and Untar the drivers and software by typing:

```
umount /cdrom
```

```
tar -xvzf seaio .tar.gz
```

7. Change to the SeaIO directory by typing:

```
cd SeaIO
```

8. Now compile and prepare the drivers for use:

```
make install
```

9. With the system off and unplugged, install your SeaIO PCI card.

10. Plug system back in and boot Linux.

```
Login as "root".
```

11. Load the driver by typing:

```
SeaIO -load
```

The driver has enabled the card and is ready to use, and you now have the option to run a test utility on it. Skip to section "Using the test software" if you wish to do so at this time.

To set up Linux to automatically load the driver; refer to a Linux manual concerning your specific distribution for help.

Physical Installation

The adapter can be installed in any PC expansion slot.

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

1. **Turn off PC power. Disconnect the power cord.**
2. Remove the PC case cover.
3. Locate an available PC slot and remove the blank metal slot cover.
4. Gently insert the REL-32
5. adapter into the slot. Make sure that the adapter is seated properly.
6. After the adapter has been installed, the cables should be routed thru the opening in the bracket. This bracket also features a strain relief function that should be used to prevent un-expected cable removal.
7. Replace the screw you removed for the blank and use it to secure the adapter into the slot. (This is required to ensure FCC Part 15 compliance.)
8. Replace the cover.
9. Connect the power cord

The REL-32 is now ready for use.

Programming the REL-32

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

Programming for Windows

The Seal/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 REL-32. If you are programming in Visual Basic, using the ActiveX control included with Seal/O is advised.

Samples and Utilities

A variety of sample programs and utilities (both executable and source code) are included with Seal/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.

Programming for Linux

Seal/O for Linux consists of two major parts: a kernel module and a library. The kernel module is a simple IO pass-through device, allowing the library to handle the more sophisticated functions provided to Seal/O users. It is provided in a 'tarball' format and can easily be compiled and included in the kernel build.

Digital I/O Interface

The REL-32 provides four parallel Reed Relay output ports. The ports are organized as 1, 2, and 3, 4.

Output Ports (Reed Relay)

Reed relays provide very high quality, long life, low power, dry contact switch closures. Reed relays are not suited for high current applications, and can be destroyed by capacitive or inductive load switching. The relays are normally open, and close when energized.

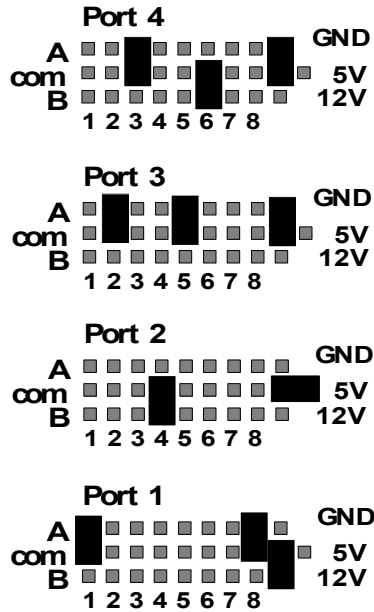
Connector and Jumper Pin Out

Each relay has two sides, an A-side and B-side. Each side is connected to two places: the cable, and the jumpers on the top of the board. The tables on the following pages provide the pin outs for the two DB-37 cable ends and the onboard jumpers.

Jumper Setup Options

The common on each port may be tied to ground, 5, or 12 volts. Either side of each relay may then be tied to the common. The 3098 is shipped with all of the jumpers necessary for all possible configurations. The jumpers are parked on the B-side and are inactive until configured by the user. An example configuration is shown below:

- Port 4: The common is tied to ground (GND).
The A-side of port-4 relay 3 (K27) is tied to the common.
The B-side of port-4 relay 6 (K30) is tied to the common.
- Port 3: The common is tied to ground (GND).
The A-side of port-3 relay 2 (K18) is tied to the common.
The A-side of port-3 relay 5 (K21) is tied to the common.
- Port 2: The common is tied to 5 volts.
The B-side of port-2 relay 4 (K12) is tied to the common.
- Port 1: The common is tied to 12 volts.
The A-side of port-1 relay 1 (K1) is tied to the common.
The A-side of port-1 relay 8 (K8) is tied to the common.



Output Ports (Reed Relay) Pin Assignments

Via standard 6' cable, DB-78 Male to dual DB-37 Male connectors, Part Number CA172. The DB-37 connectors are labeled "Ports 1,2" and "Port 3,4".

| Relay | Port 1 | | | | Relay | Port 2 | | | |
|-------|--------------|-----|--------------|-----|-------|--------------|-----|--------------|-----|
| | Relay A Side | | Relay B Side | | | Relay A Side | | Relay B Side | |
| | Port 1 - A | Pin | Port 1 - B | Pin | | Port 2 - A | Pin | Port 2 - B | Pin |
| K1 | 1 | 2 | 1 | 20 | K9 | 1 | 10 | 1 | 28 |
| K2 | 2 | 3 | 2 | 21 | K10 | 2 | 11 | 2 | 29 |
| K3 | 3 | 4 | 3 | 22 | K11 | 3 | 12 | 3 | 30 |
| K4 | 4 | 5 | 4 | 23 | K12 | 4 | 13 | 4 | 31 |
| K5 | 5 | 6 | 5 | 24 | K13 | 5 | 14 | 5 | 32 |
| K6 | 6 | 7 | 6 | 25 | K14 | 6 | 15 | 6 | 33 |
| K7 | 7 | 8 | 7 | 26 | K15 | 7 | 16 | 7 | 34 |
| K8 | 8 | 9 | 8 | 27 | K16 | 8 | 17 | 8 | 35 |

| Relay | Port 3 | | | | Relay | Port 4 | | | |
|-------|--------------|-----|--------------|-----|-------|--------------|-----|--------------|-----|
| | Relay A Side | | Relay B Side | | | Relay A Side | | Relay B Side | |
| | Port 3 - A | Pin | Port 3 - B | Pin | | Port 4 - A | Pin | Port 4 - B | Pin |
| K17 | 1 | 2 | 1 | 20 | K25 | 1 | 10 | 1 | 28 |
| K18 | 2 | 3 | 2 | 21 | K26 | 2 | 11 | 2 | 29 |
| K19 | 3 | 4 | 3 | 22 | K27 | 3 | 12 | 3 | 30 |
| K20 | 4 | 5 | 4 | 23 | K28 | 4 | 13 | 4 | 31 |
| K21 | 5 | 6 | 5 | 24 | K29 | 5 | 14 | 5 | 32 |
| K22 | 6 | 7 | 6 | 25 | K30 | 6 | 15 | 6 | 33 |
| K23 | 7 | 8 | 7 | 26 | K31 | 7 | 16 | 7 | 34 |
| K24 | 8 | 9 | 8 | 27 | K32 | 8 | 17 | 8 | 35 |

Power and Ground Pin Assignments

Via standard 6' cable, DB-78 Male to dual DB-37 Male connectors, Part Number CA172.

| | |
|------------|------------|
| Ground | 18, 36, 37 |
| + 5 Volts | 19 |
| + 12 Volts | 1 |

Optional DB-37 Female Pin Assignment

In order to maintain compatibility with the existing ISA interface adapter (Sealevel Item# 3098), an optional 6' cable is offered with DB-78 Male to dual DB-37 Female connectors, Part Number CA173. The DB-37 connectors are labeled "Side A" and "Side B".

| Side A | | | Side B | | |
|--------|-----------|-----------|--------|-----------|-----------|
| Pin | Function | Jumper | Pin | Function | Jumper |
| 1 | Ground | N/A | 1 | Ground | N/A |
| 2 | Relay 2A | PORT 1-A2 | 2 | Relay 2B | PORT 1-B2 |
| 3 | Relay 4A | PORT 1-A4 | 3 | Relay 4B | PORT 1-B4 |
| 4 | Relay 6A | PORT 1-A6 | 4 | Relay 6B | PORT 1-B6 |
| 5 | Relay 8A | PORT 1-A8 | 5 | Relay 8B | PORT 1-B8 |
| 6 | Relay 10A | PORT 2-A2 | 6 | Relay 10B | PORT 2-B2 |
| 7 | Relay 12A | PORT 2-A4 | 7 | Relay 12B | PORT 2-B4 |
| 8 | Relay 14A | PORT 2-A6 | 8 | Relay 14B | PORT 2-B6 |
| 9 | Relay 16A | PORT 2-A8 | 9 | Relay 16B | PORT 2-B8 |
| 10 | Relay 18A | PORT 3-A2 | 10 | Relay 18B | PORT 3-B2 |
| 11 | Relay 20A | PORT 3-A4 | 11 | Relay 20B | PORT 3-B4 |
| 12 | Relay 22A | PORT 3-A6 | 12 | Relay 22B | PORT 3-B6 |
| 13 | Relay 24A | PORT 3-A8 | 13 | Relay 24B | PORT 3-B8 |
| 14 | Relay 26A | PORT 4-A2 | 14 | Relay 26B | PORT 4-B2 |
| 15 | Relay 28A | PORT 4-A4 | 15 | Relay 28B | PORT 4-B4 |
| 16 | Relay 30A | PORT 4-A6 | 16 | Relay 30B | PORT 4-B6 |
| 17 | Relay 32A | PORT 4-A8 | 17 | Relay 32B | PORT 4-B8 |
| 18 | 12 V | N/A | 18 | 12 V | N/A |
| 19 | 5 V | N/A | 19 | 5 V | N/A |
| 20 | Relay 1A | PORT 1-A1 | 20 | Relay 1B | PORT 1-B1 |
| 21 | Relay 3A | PORT 1-A3 | 21 | Relay 3B | PORT 1-B3 |
| 22 | Relay 5A | PORT 1-A5 | 22 | Relay 5B | PORT 1-B5 |
| 23 | Relay 7A | PORT 1-A7 | 23 | Relay 7B | PORT 1-B7 |
| 24 | Relay 9A | PORT 2-A1 | 24 | Relay 9B | PORT 2-B1 |
| 25 | Relay 11A | PORT 2-A3 | 25 | Relay 11B | PORT 2-B3 |
| 26 | Relay 13A | PORT 2-A5 | 26 | Relay 13B | PORT 2-B5 |
| 27 | Relay 15A | PORT 2-A7 | 27 | Relay 15B | PORT 2-B7 |
| 28 | Relay 17A | PORT 3-A1 | 28 | Relay 17B | PORT 3-B1 |
| 29 | Relay 19A | PORT 3-A3 | 29 | Relay 19B | PORT 3-B3 |
| 30 | Relay 21A | PORT 3-A5 | 30 | Relay 21B | PORT 3-B5 |
| 31 | Relay 23A | PORT 3-A7 | 31 | Relay 23B | PORT 3-B7 |
| 32 | Relay 25A | PORT 4-A1 | 32 | Relay 25B | PORT 4-B1 |
| 33 | Relay 27A | PORT 4-A3 | 33 | Relay 27B | PORT 4-B3 |
| 34 | Relay 29A | PORT 4-A5 | 34 | Relay 29B | PORT 4-B5 |
| 35 | Relay 31A | PORT 4-A7 | 35 | Relay 31B | PORT 4-B7 |
| 36 | Ground | N/A | 36 | Ground | N/A |
| 37 | Ground | N/A | 37 | Ground | N/A |

DB-78 Female Pin Assignment

This table shows the pin assignments via the card edge connector.

| | Port 1 | | | | | Port 2 | | | |
|-------|--------------|-----|--------------|-----|-------|--------------|-----|--------------|-----|
| | Relay A Side | | Relay B Side | | | Relay A Side | | Relay B Side | |
| Relay | Port 1 - A | Pin | Port 1 - B | Pin | Relay | Port 2 - A | Pin | Port 2 - B | Pin |
| K1 | 1 | 2 | 1 | 20 | K9 | 1 | 10 | 1 | 28 |
| K2 | 2 | 3 | 2 | 21 | K10 | 2 | 11 | 2 | 29 |
| K3 | 3 | 4 | 3 | 22 | K11 | 3 | 12 | 3 | 30 |
| K4 | 4 | 5 | 4 | 23 | K12 | 4 | 13 | 4 | 31 |
| K5 | 5 | 6 | 5 | 24 | K13 | 5 | 14 | 5 | 32 |
| K6 | 6 | 7 | 6 | 25 | K14 | 6 | 15 | 6 | 33 |
| K7 | 7 | 8 | 7 | 26 | K15 | 7 | 16 | 7 | 34 |
| K8 | 8 | 9 | 8 | 27 | K16 | 8 | 17 | 8 | 35 |

| | Port 3 | | | | | Port 4 | | | |
|-------|--------------|-----|--------------|-----|-------|--------------|-----|--------------|-----|
| | Relay A Side | | Relay B Side | | | Relay A Side | | Relay B Side | |
| Relay | Port 3 - A | Pin | Port 3 - B | Pin | Relay | Port 4 - A | Pin | Port 4 - B | Pin |
| K17 | 1 | 39 | 1 | 57 | K25 | 1 | 47 | 1 | 65 |
| K18 | 2 | 40 | 2 | 58 | K26 | 2 | 48 | 2 | 66 |
| K19 | 3 | 41 | 3 | 59 | K27 | 3 | 49 | 3 | 67 |
| K20 | 4 | 42 | 4 | 60 | K28 | 4 | 50 | 4 | 68 |
| K21 | 5 | 43 | 5 | 61 | K29 | 5 | 51 | 5 | 69 |
| K22 | 6 | 44 | 6 | 62 | K30 | 6 | 52 | 6 | 70 |
| K23 | 7 | 45 | 7 | 63 | K31 | 7 | 53 | 7 | 71 |
| K24 | 8 | 46 | 8 | 64 | K32 | 8 | 54 | 8 | 72 |

Power and Ground Pin Assignments

Via DB-78 Female card edge connector.

| | |
|------------|------------------------|
| Ground | 18, 36, 37, 55, 73, 74 |
| + 5 Volts | 19, 56 |
| + 12 Volts | 1, 38 |

Direct Hardware Control

In systems where the users program has direct access to the hardware (DOS) the table below gives the mapping and functions that the REL-32 provides.

| Function Available | Port | Address Hex | Port Type |
|--------------------|------|-------------|---------------------|
| R/W | 1 | Base + 0 | Relay 1- Relay 8 |
| R/W | 2 | Base + 1 | Relay 9 - Relay 16 |
| R/W | 3 | Base + 2 | Relay 17 - Relay 24 |
| R/W | 4 | Base + 3 | Relay 25 - Relay 32 |

R/W = Read or Write

Reading the Outputs

The relay ports return the ones complement of the value that is currently being used to drive the relays. When using the API the value is returned not the complement of the value.

Writing the Outputs

The relays on a standard 3098 are normally open. To close a relay a one must be written to the appropriate bit.

Register Description

| Address | Mode | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
|---------|------|------|------|------|------|------|------|------|------|
| Base+0 | R/W | P1D7 | P1D6 | P1D5 | P1D4 | P1D3 | P1D2 | P1D1 | P1D0 |
| Base+1 | R/W | P2D7 | P2D6 | P2D5 | P2D4 | P2D3 | P2D2 | P2D1 | P2D0 |
| Base+2 | R/W | P3D7 | P3D6 | P3D5 | P3D4 | P3D3 | P3D2 | P3D1 | P3D0 |
| Base+3 | R/W | P4D7 | P4D6 | P4D5 | P4D4 | P4D3 | P4D2 | P4D1 | P4D0 |

Electrical Characteristics

Features

- Selectable I/O port addressing from 200H – 3F8H
- 4 sets of SPST Reed relays with each set having 8 relays
- Highly reliable 10 VA DIP reed relays utilized
- Multiple adapters can reside in same computer
- All address, data and control signals are TTL compatible

Specifications

Output Relays

- Contact Max Power Rating: 10 W
- Contact Voltage Maximum: 100 VDC/VAC
- Contact Current Maximum: .5A AC/DC RMS
- Contact Resistance, Initial: .15 Ω
- Rated Life:
 - Low Load: 200 Million Closures
 - Maximum Load: 100 Million Closures
- Contact Speed:
 - Operate: .5 mS
 - Release: .5 mS
 - Bounce: .5 mS
- Maximum Operating Speed: 600 Hz

Temperature Range

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

Power Requirements

- +5VDC @ 800mA
- +12VDC @ 50mA

Physical Dimensions

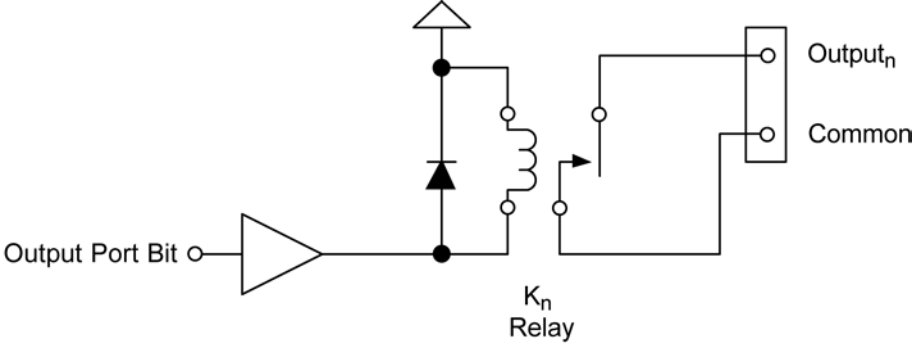
- PCB Length: 13.3" (33.9 cm)
- PCB Height: 4.2" (10.7 cm, including Gold fingers)

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.

Example Circuits

Output Circuit



Appendix A - Troubleshooting

Following these simple steps can eliminate most common problems.

1. **Install software first.** After installing the software then proceed to adding the hardware. This places the required installation files in the correct locations.
2. Read this manual thoroughly before attempting to install the adapter in your system.
3. Use Device Manager under Windows to verify proper installation.
4. Use the SeaIO Control Panel applet or the Device Manager's property page for card identification and configuration.
5. The following are known I/O conflicts:
 - The 278 and 378 settings may conflict with your printer I/O adapter.
 - 3B0 cannot be used if a Monochrome adapter is installed.
 - 3F8-3FF is typically reserved for COM1:
 - 2F8-2FF is typically reserved for COM2:
 - 3E8-3EF is typically reserved for COM3:
 - 2E8-2EF is typically reserved for COM4:
6. 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-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.

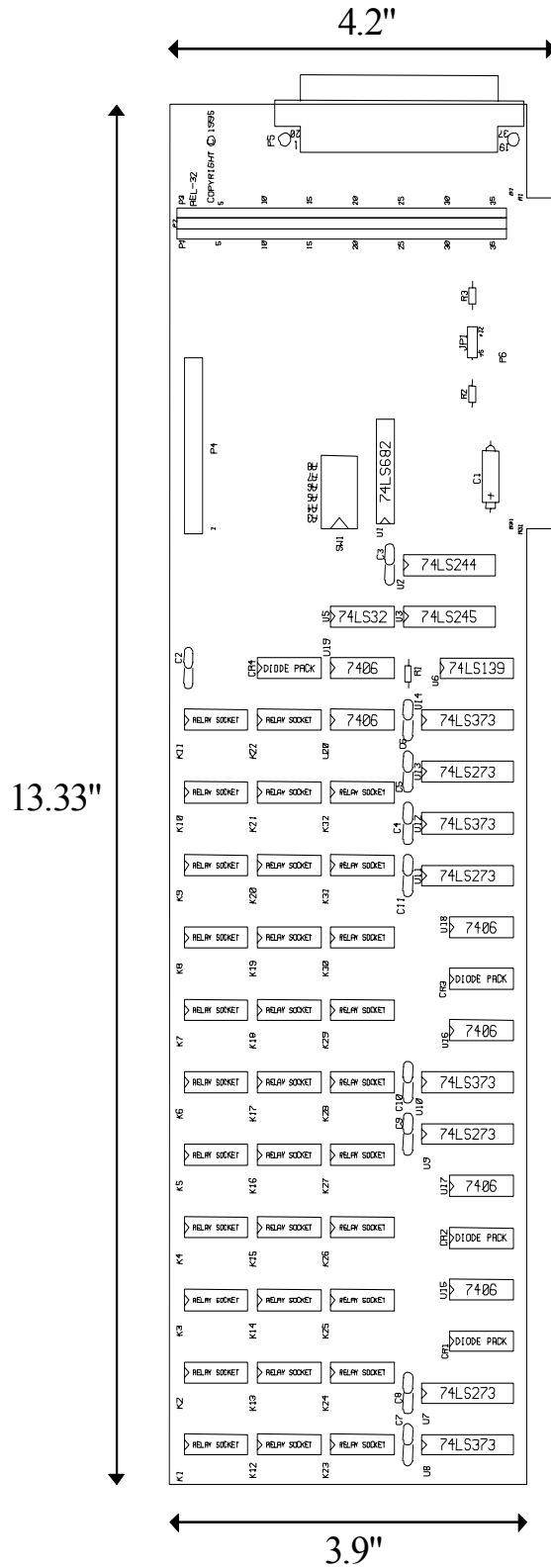
Sealevel Systems provides an FAQ section on its web site. Please refer to this to answer many common questions. This section can be found at <http://www.sealevel.com/faq.asp>

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 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 – 3098 PCB



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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