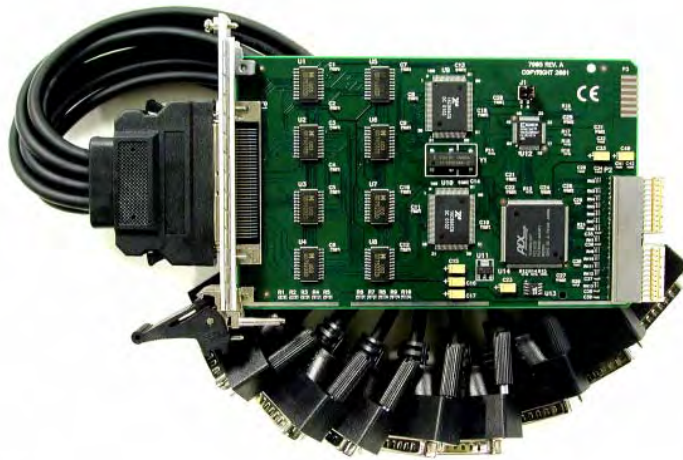




# *COMM+8.cPCI™*

## *USER MANUAL*



**Part # 7905**

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## Introduction

### Overview

The Sealevel Systems **COMM+8.cPCI** is an eight-channel serial I/O adapter for Compact PCI compliant machines. The **COMM+8.cPCI** allows for connection to any device utilizing the RS-232 electrical interface, such as modems, data-entry terminals, and plotters.

### What's Included

The **COMM+8.cPCI** is shipped with the following items. If any of these items is missing or damaged, contact the supplier.

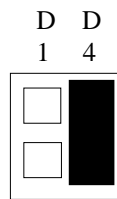
- **COMM+8.cPCI** Serial I/O Adapter
- HD-68 to eight DB-25 'Spider Cable'
- Sealevel Software

## Card Setup

### Clock Modes

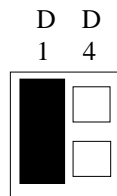
The **COMM+8.cPCI** employs a unique clocking option that allows the end user to select from divide by 4 and divide by 1 clocking modes. This mode is selected at J1.

To select the Baud rates commonly associated with COM: ports (i.e. 2400, 4800, 9600, 19.2, ... 115.2K Bps) place the jumper in the divide by 4 mode (silk-screen D4).



*Figure 1 - Clocking Mode 'Divide By 4'*

To select the maximum data rate (460.8K bps) place the jumper in the divide by 1 (silk-screen D1) position.



*Figure 2 - Clocking Mode 'Divide By 1'*

### Baud Rates and Divisors for the 'D1' mode

The following table shows some common data rates and the rates you should choose to match them if using the adapter in the 'Div1' mode.

| For this Data Rate | Choose this Data Rate |
|--------------------|-----------------------|
| 1200 bps           | 300 bps               |
| 2400 bps           | 600 bps               |
| 4800 bps           | 1200 bps              |
| 9600 bps           | 2400 bps              |
| 19.2K bps          | 4800 bps              |
| 57.6 K bps         | 14.4K bps             |
| 115.2 K bps        | 28.8K bps             |
| 230.4K bps         | 57.6 K bps            |
| 460.8K bps         | 115.2 K bps           |

If your communications package allows the use of Baud rate divisors, choose the appropriate divisor from the following table:

| For this Data Rate | Choose this Divisor |
|--------------------|---------------------|
| 1200 bps           | 384                 |
| 2400 bps           | 192                 |
| 4800 bps           | 96                  |
| 9600 bps           | 48                  |
| 19.2K bps          | 24                  |
| 38.4K bps          | 12                  |
| 57.6K bps          | 8                   |
| 115.2K bps         | 4                   |
| 230.4K bps         | 2                   |
| 460.8K bps         | 1                   |

### Address and IRQ selection

The **COMM+8.cPCI** is automatically assigned I/O addresses and IRQs by your motherboard BIOS. Only the I/O address may be modified by the user.

Adding or removing other hardware may change the assignment of I/O addresses and IRQs.

## Installation

### Operating System Installation

#### For Windows Users

Start by choosing **Install Software at the beginning of the CD. Choose Asynchronous COM: Port Software, SeaCOM.**

#### Other Operating Systems

Refer to the appropriate section of the Serial Utilities Software.

### System Installation

The **COMM+8.cPCI** can be installed in any of the cPCI expansion slots and contains configuration options for each port that must be set for proper operation.

1. **Turn off PC power. Disconnect the power cord.**
2. Locate an available cPCI slot and remove the blank metal slot cover.
3. Gently insert the **COMM+8.cPCI** into the slot. Make sure that the adapter is seated properly.
4. Replace the cover.
5. Install the Cable (CA-191)
6. Connect the power cord.

Installation is complete.

## Technical Description

The Sealevel Systems **COMM+8.cPCI** provides a PCI interface adapter with 8 RS-232 asynchronous serial ports for industrial automation and control applications.

The **COMM+8.cPCI** utilizes the 16C864 UART. This chip features programmable baud rates, data format, interrupt control and industry leading 128-byte transmit and receive FIFOs.

### Connector Pin Assignments

#### DB-25 (RS-232 DTE) (DB25 MALE)

| Signal | Name                | Pin # | Mode   |
|--------|---------------------|-------|--------|
| GND    | Ground              | 7     |        |
| TD     | Transmit Data       | 2     | Output |
| RTS    | Request To Send     | 4     | Output |
| DTR    | Data Terminal Ready | 20    | Output |
| RD     | Receive Data        | 3     | Input  |
| CTS    | Clear To Send       | 5     | Input  |
| DSR    | Data Set Ready      | 6     | Input  |
| DCD    | Data Carrier Detect | 8     | Input  |
| RI     | Ring Indicator      | 22    | Input  |

*Technical Note:* Please terminate any control signals that are not going to be used. The most common way to do this is connect RTS to CTS and RI. Also, connect DCD to DTR and DSR. Terminating these pins, if not used, will help insure you get the best performance from your adapter.

#### HD-68 Connector Pin Assignments (HD-68 Female)

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



---

## Specifications

### Environmental Specifications

| Specification     | Operating                        | Storage                          |
|-------------------|----------------------------------|----------------------------------|
| Temperature Range | 0° to 50° C<br>(32° to 122° F)   | -20° to 70° C<br>(-4° to 158° F) |
| Humidity Range    | 10 to 90% R.H.<br>Non-Condensing | 10 to 90% R.H.<br>Non-Condensing |

### Power Consumption

|             |         |         |        |
|-------------|---------|---------|--------|
| Supply line | +12 VDC | -12 VDC | +5 VDC |
| Rating      | 125 mA  | 125 mA  | 210 mA |

### Mean Time Between Failures (MTBF)

Greater than 150,000 hours. (Calculated)

### Physical Dimensions

The adapter conforms to the requirements of a 3U Adapter as set forth by the PCI SIG.

## **Appendix A - Troubleshooting**

Sealevel Software is supplied with the Sealevel Systems adapter and will be used in the troubleshooting procedures. By using this software and following these simple steps, most common problems can be eliminated without the need to call Technical Support.

1. 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.
2. Make sure the Sealevel Systems adapter is securely installed in a motherboard slot.
3. When running DOS or Windows 3.x refer to the supplied Sealevel Software and this User Manual to verify that the Sealevel Systems adapter is configured correctly. This software contains a diagnostic program 'SSD' that will verify if an adapter is configured properly. This diagnostic program is written with the user in mind and is easy to use.
4. For Windows 95/98/ME/NT/2000/XP, the diagnostic tool 'WinSSD' is 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.
5. Always use the Sealevel Systems diagnostic software when troubleshooting a problem. This will eliminate any software issues from the equation.

## Appendix B - How To Get Assistance

Please refer to Troubleshooting Guide prior to calling Technical Support.

1. Read this manual thoroughly before attempting to install the adapter in your system.
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 maintains a Home page on the Internet. Our home page address is [www.sealevel.com](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.
4. 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 - 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 wide spread 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 Universal 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.

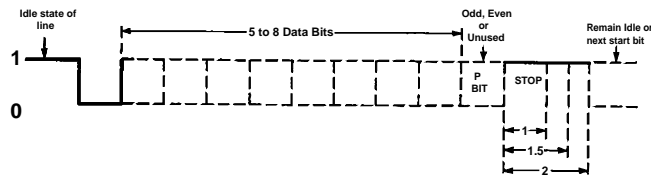
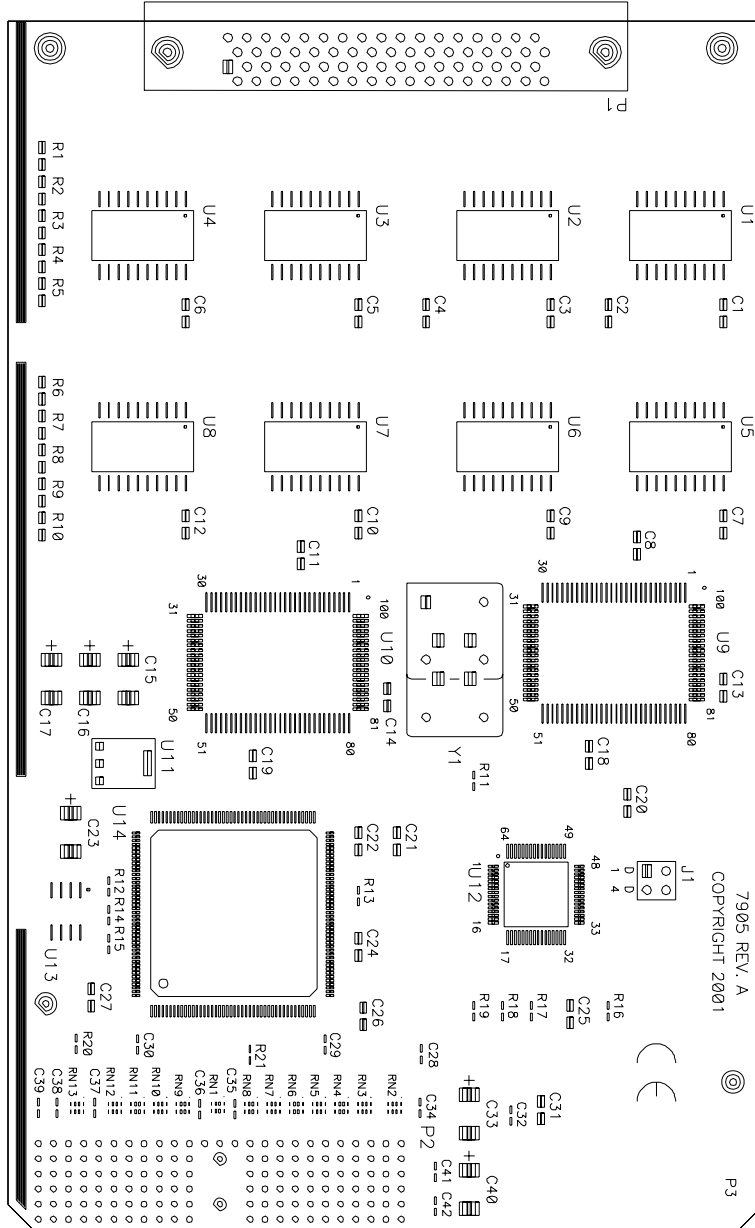


Figure 3 - Asynchronous Communications Bit Diagram

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 - Silk-Screen



## Appendix F - 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 his own 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.**

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 Systems, Inc. provides a lifetime warranty for this product. Should this product fail to be in good working order at any time during this period, Sealevel Systems will, at its option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster.

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.

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