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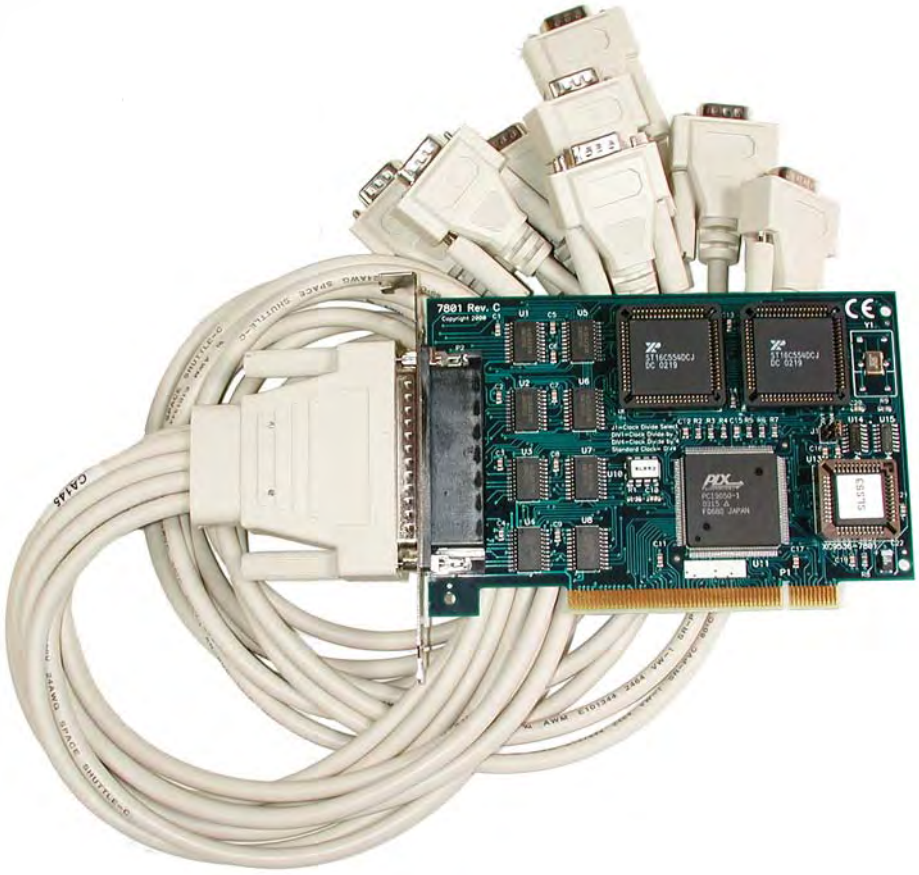
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SEALEVEL
SYSTEMS INCORPORATED

COMM+8.PCI
Users Manual



Part Number 7801 and 7801-DB9

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Introduction

Overview

The Sealevel Systems **COMM+8.PCI** provides the PC with eight RS-232 asynchronous ports. The **COMM+8.PCI** 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.PCI** is shipped with the following items. If any of these items is missing or damaged, contact the supplier.

- **COMM+8.PCI** Serial I/O Adapter
- Cable consisting of either (1) DB-78 Female to (8) DB-25 Males (7801)
  or (1) DB-78 Female to (8) DB-9 Males (7801-DB9).
- Sealevel Software CD

Card Setup

Clock Modes

The **COMM+8.PCI** 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 DIV4).

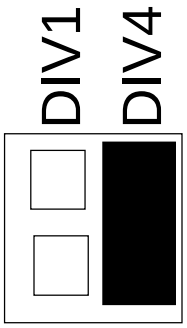


Figure 1 - Clocking Mode 'Divide By 4'

To select the maximum data rate (460.8K bps) place the jumper in the divide by 1 (silk-screen DIV1) position.

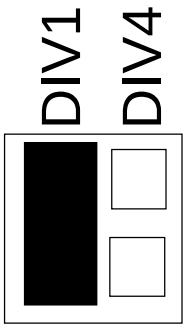


Figure 2 - Clocking Mode 'Divide By 1'

Baud Rates and Divisors for the 'Div1' 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.PCI** is automatically assigned I/O addresses and IRQs by your motherboard BIOS. Often, moving the board to another slot will change the I/O address or IRQ. Also adding or removing other hardware may change the assignment of I/O addresses and IRQs.

Installation

Operating System Installation

Windows 95/98/ME/NT/2000/XP

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 of the CD
4. Select 'Install Software'.
5. Select the part number for your adapter from the listing.
6. Select 'Windows 95/98/ME/NT/2000/XP' then (depending on the OS version) select the 'Run Here' or 'Open' option. Follow the information presented on the screens that follow.

Linux

Refer to D:\software\seacom\Other\Linux**Linux.serial.readme** (where D: = your CDROM driver letter) found on the Sealevel Systems CD. This file contains valuable information on installing your adapter in the various Linux releases. Also in this sub-directory is the **Linux SerialHOWTO.** This series of files explains typical Linux serial implementations, as well as informing the user to Linux syntax and preferred practices.

QNX

Refer to D:\software\seacom\Other\QNX6**Install.readme** (where D: = your CDROM driver letter) found on the Sealevel Systems CD. This file contains valuable information on installing your adapter in the QNX6 Neutrino OS, as well as the files required to ensure a flawless implementation. Also provided on the Sealevel Systems CD are implementation instructions for QNX4. These are found in D:\software\seacom\Other\QNX4**QNX_COM.txt.**

Physical Installation

The adapter can be installed in any 5V PCI expansion slot and contains several jumper straps for each port that must be set for proper.

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 PCI slot and remove the blank metal slot cover.
4. Gently insert the PCI adapter into the slot. Make sure that the adapter is seated properly.
5. Replace the screw. (This is required to ensure FCC Part 15 compliance.)
6. Replace the cover.
7. Connect the power cord

Installation is finished.

Technical Description

The **COMM+8.PCI** utilizes the 16C554 UART. This chip features programmable baud rate, data format, interrupt control and a 16-byte input and output FIFO, and is functionally 4 16C550 UARTs. . The 16C854 UART is also available on this card, which has a 128-byte FIFO as opposed to the 16-byte FIFO available in the 16C554.

Connector Pin Assignments

DB-25 Male (EIA-232 DTE)

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

DB-9 Male (EIA-574 DTE)

Signal	Name	Pin #	Mode
GND	Ground	5	
TD	Transmit Data	3	Output
RTS	Request To Send	7	Output
DTR	Data Terminal Ready	4	Output
RD	Receive Data	2	Input
CTS	Clear To Send	8	Input
DSR	Data Set Ready	6	Input
DCD	Data Carrier Detect	1	Input
RI	Ring Indicator	9	Input

DB-78 Male (Card Edge Connector)

Port #	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
TD	36	12	27	3	75	51	66	42
RD	37	11	28	2	76	50	67	41
RTS	17	31	8	22	56	70	47	61
CTS	16	32	7	23	55	71	46	62
DTR	35	13	26	4	74	52	65	43
DSR	18	30	9	21	57	69	48	60
DCD	38	10	29	1	77	49	68	40
RI	15	33	6	24	54	72	45	63
GND	34	14	25	5	73	53	64	44

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.

Specifications

Environmental Specifications

Specification	Operating	Storage
Temperature Range	0º to 70º C (32º to 158º F)	-50º to 105º C (-58º to 221º 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.

Power Consumption

Supply line	+12 VDC	-12 VDC	+5 VDC
Rating	60 mA	100 mA	295 mA

Mean Time Between Failures (MTBF)

Greater than 150,000 hours. (Calculated)

Physical Dimensions

Board length	5.650 inches	(14.351 cm.)
Board Height including Goldfingers	3.8 inches	(9.652 cm.)
Board Height excluding Goldfingers	3.475 inches	(8.827 cm.)

Appendix A - Troubleshooting

Sealevel Software is supplied with the Sealevel Systems adapter and may be used in the troubleshooting procedures. Using this software and following these simple steps can eliminate most common problems 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. 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.

3. Make sure the Sealevel Systems adapter is using a unique IRQ. While the Sealevel Systems adapter does allow the sharing of IRQs, many other adapters (i.e. SCSI adapters & on-board serial ports) do not. The IRQ is typically selected by the BIOS or Operating system. Some BIOS setup software will allow changing the IRQ, but others do not. Another method of changing assigned resources is to try changing PCI slots. This will typically cause the BIOS or OS to reassign the resources.

4. Make sure the Sealevel Systems adapter is securely installed in a motherboard slot.

5. 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' (D:\software\seacom\Other\DOS\DIAG, where D: = the driver letter of your CDROM drive) will verify if an adapter is configured properly. This diagnostic program is written with the user in mind and is easy to use. You can use D:\software\seacom\Other\DOS\PCI\FindPCI.exe to determine resources that have been assigned to your adapter. Make sure that if available, the 'Use Plug-n-Play" option is turned **'OFF'** in your BIOS. Having this option set to **'ON**' in DOS or Windows 3.x will cause erratic operations.

6. For Windows95/98/ME/NT/2000, 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.

7. 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. 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 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 - 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 **D**ata **T**erminal **E**quipment (**DTE**) and **D**ata **C**ircuit-Terminating **E**quipment (**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.

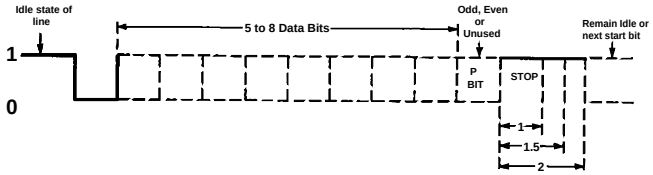
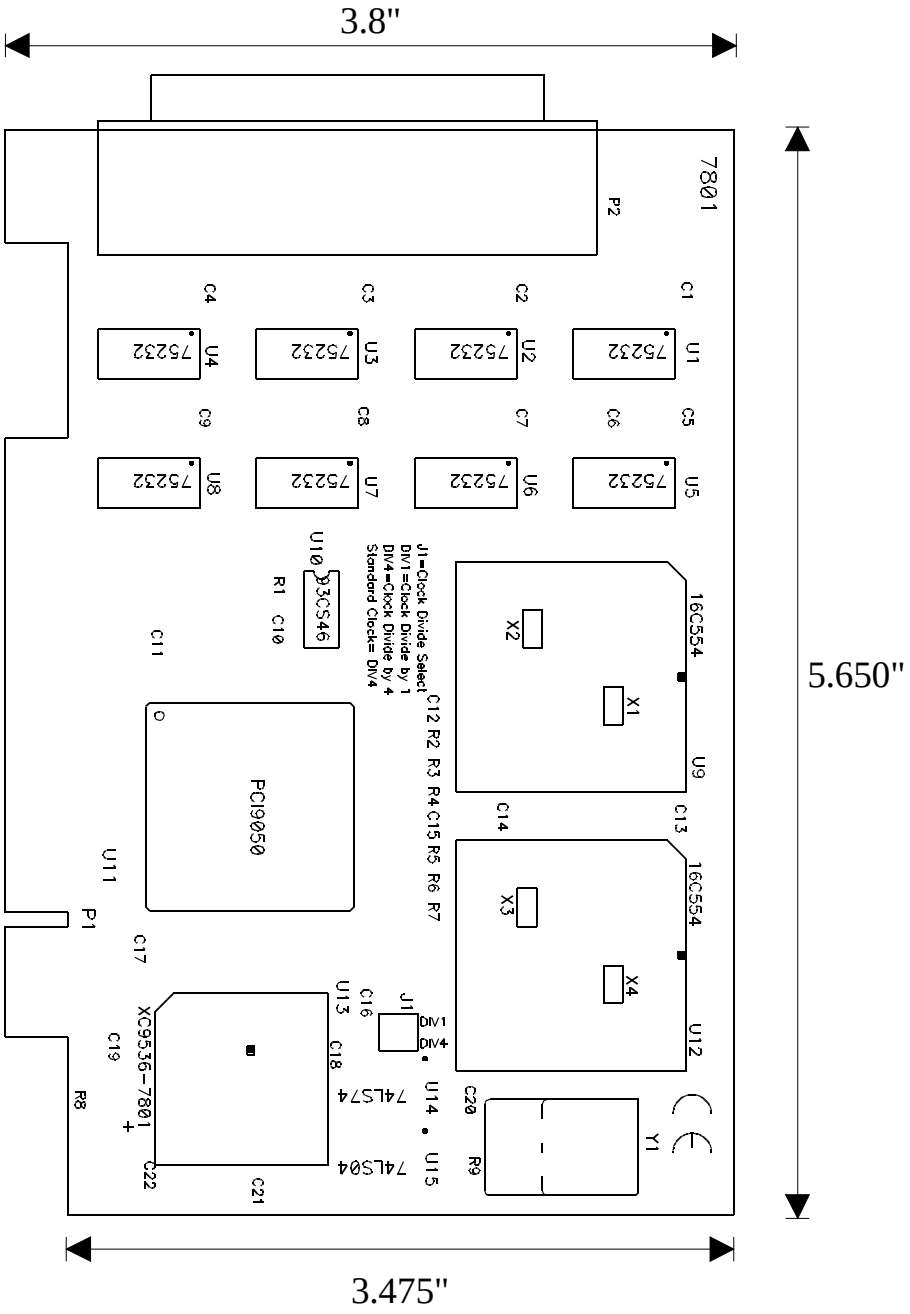


Figure 3 - Asynchronous Communications Bit Diagram

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 refereed 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 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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