SEALEVEL
SYSTEMS INCORPORATED

ACB-188™
PART # 4019
USER MANUAL

SECTIONS:

FIGURES:

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SECTION 1.

Installation

The **ACB-188** can be installed in any of the PC expansion slots. Remove the PC case, remove the blank metal slot cover, and insert the board. Replace the screw, replace the case, and installation is complete.

Be sure to set the address and jumper options before installation.

SECTION 2.

Address Selection

The **ACB-188** occupies 8 consecutive I/O locations. A 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						
Hex	A9----------A0	1	2	3	4	5	6	7
238-23F	1000111XXX	Off	On	On	On	Off	Off	Off
280-287	1010000XXX	Off	On	Off	On	On	On	On
2A0-2A7	1010100XXX	Off	On	Off	On	Off	On	On
2E8-2EF	1011101XXX	Off	On	Off	Off	Off	On	Off
300-307	1100000XXX	Off	Off	On	On	On	On	On
328-32F	1100101XXX	Off	Off	On	On	Off	On	Off
3E8-3EF	1111101XXX	Off	Off	Off	Off	Off	On	Off

TYPICALLY COM1:=3F8h; COM2:=2F8h; COM3:=3E8h; COM4:=2E8h.

Figure 1
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, the address 300 Hex through 307 Hex is selected. 300 Hex =11 0000 0XXX in binary representation.

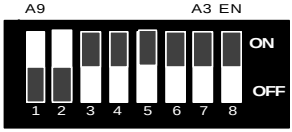

Figure 2
DIP-switch SW-1

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

The **ACB-188** can be enabled or disabled with switch position 8 on the DIP-switch. The port is enabled with the switch "On" or "Closed" and disabled when "Off" or "Open".

The relative I/O address of the 8530 SCC registers is as follows:

- Base+0 Channel A Data Port
- Base+1 Channel A Control Port
- Base+2 Channel B Data Port
- Base+3 Channel B Control Port

Where "Base" is the selected board base address.

SECTION 3.

Option Selection

The board contains several jumper straps which must be set for proper operation. For jumper locations, refer to the silk-screen diagram in the back of this manual.

IRQ Selection

E2 - Selects the interrupt request for the **ACB-188**.

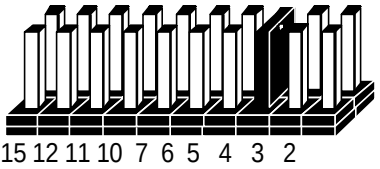

Figure 3
Header E2, IRQ 4 Selected

Interrupt Modes

Figure 4.1 illustrates the **N**ormal, single interrupt per port mode. Figure 4.2 illustrates the **S**hared interrupt mode, which allows more than one port to access a single IRQ. Figure 4.3 indicates the **M**ulti-port mode that signifies inclusion of a 1K ohm pull-down resistor required on one port when sharing interrupts.

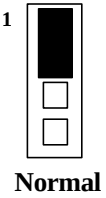

Figure 4.1:
Header E3 Illustration Part 1.

Figure 4.2 illustrates the **S**hared interrupt mode, which allows more than one port to access a single IRQ.

Note: Setting the **ACB-188** in this configuration when it is not accompanied by a pull-down resistor (see Figure 4.3) will prevent the ports from triggering an interrupt.

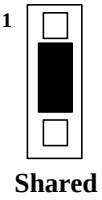

Figure 4.2
Header E3 Illustration Part 2.

If shared interrupts are required on two or more **ACB-188**'s set the jumpers for shared interrupt mode on all ports sharing an IRQ except one. Set that port block as the example 4.3. This provides the pull-down resistor circuit that makes sharing of IRQ's possible. If you are using more than one **ACB-188** or a compatible card in a bus you should only have one port set as Figure 4.3.

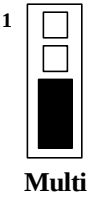

Figure 4.3
Header E3 Illustration Part 3.

E1 **-** On port 1 to have the driver enabled by RTS place the jumper at the “RTS” A position. To have the driver always enabled or always on place the jumper at the “ON” A position. On port 2 to have the driver enabled by RTS place the jumper at the “RTS” B position. To have the driver always enabled or always on place the jumper at the “ON” B position.

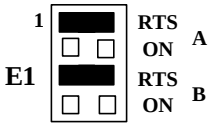

Figure 5.

E4 - A unique feature of the **ACB-188** is the capability to receive single ended transmissions or differential transmissions. Placing the jumpers in the “B” position ground the unused pins allowing single ended reception. To select differential transmissions place all jumpers in the “B” position as shown in Figure 6. To select single ended positive (+) transmissions place jumpers as shown in Figure 7. To select single ended negative (-) transmissions place the jumpers as shown in Figure 8.

Signal Name		DB-15 PIN #
Transmit Positive	TX+	6
Transmit Negative	TX-	2
Request to Send Positive	RTS +	5
Request to Send Negative	RTS -	4
Receive Data Positive	RD+	8
Receive Data Negative	RD-	3
Receive Clock Positive	RXC +	9
Receive Clock Negative	RXC -	10
Ground	GND	7
“Push to Talk”	PTT	15

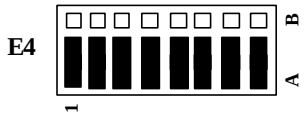

Figure 6
MIL-188-114 Differential

Signal Name:		DB-15 PIN #
Transmit	TX	6
Request to Send	RTS	5
Receive Data	RD	8
Receive Clock	RXC	9
Ground	GND	7
“Push to Talk”	PTT	15

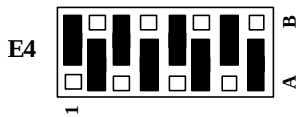

Figure 7
MIL-188-C Single Ended Positive Logic

Signal Name:		DB-15 PIN #
Transmit	TX	2
Request to Send	RTS	4
Receive Data	RD	3
Receive Clock	RXC	10
Ground	GND	7
“Push to Talk”	PTT	15

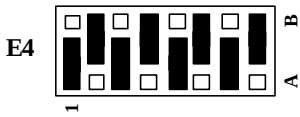

Figure 8
MIL-188-200 Single Ended Negative Logic

SECTION 4

Technical Description

The Sealevel Systems **ACB-188** provides the PC with two high speed Sync / Async ports. The **ACB-188** can be used in a variety of sophisticated communications applications such as SDLC, HDLC, X.25, and high speed Async.

Features include:

- Two channels of Sync / Async communications using 8530 .
- Selectable port address and IRQ level (2-7, 10, 11, 12, 15)
- Direct connection to SINCGARS Military Radio digital interface

The **ACB-188** utilizes the Zilog 8530 Serial Communications Controller (SCC). This chip features programmable baud rate, data format and interrupt control. Refer to the 8530 Technical Manual for details on programming the 8530 chip.

Internal Baud Rate Generator

The baud rate of the SCC is programmed under software control. The standard oscillator supplied with the board is 4.9152 MHz. However, other oscillator values can be substituted to achieve different baud rates.

ACB Developer Toolkit Diskette and the ACB Resource Kit

The ACB Developer Toolkit diskette provides sample software and technical insight to aid in the development of reliable applications and device drivers for the ACB family of communication cards. The goal in publishing this collection of source code and technical information is two fold. First is to provide the developer with ample information to develop ACB based applications. Second is to provide a channel for suggestions into the technical support efforts. The ACB Resource Kit provides a brief overview of the ACB product line. Topics concerning applications and integration are covered to provide a complete overview of the versatile ACB family. During ACB development, any questions, comments, suggestions, or requests for the ACB Resource Kit Literature should be directed to Sealevel Systems Technical Support at the numbers listed at the end of this manual.

SECTION 5.

Specifications

Environmental

Specification	Operating	Storage
Temperature range	0 - 50 Degrees C 32 - 122 Degrees F	-20 - 70 Degrees C -40 - 100 Degrees F
Humidity Range	0- 90% R.H. Non-Condensing	0- 90% R.H. Non-Condensing

Performance

MTBF > 150,000 Hours
MTTR < .25 Hours
Turnaround for repair - 5 working days

Manufacturing

- Adherence to IPC 610-A Class-III standards with a 0.1 visual A.Q.L. and 100% functional testing.
- Boards are built to U.L. 94V0 rating and are 100% electrically tested. Boards are solder mask over bare copper or solder mask over tin nickel.

Power

Supply Line	+5	-5
Rating (mA)	420 mA	50 mA

SECTION 6.

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 it's 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.

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.

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Appendix A

SINCGARS Specific Application Notes:

Recommended Cabling

The following connections are made to directly interface to a SINCGARS Military Radio. Please note that the Mode pin is connected to ground (GND) to select digital data mode.

SINCGARS	Description	ACB-188
A	GND	7
B	Rx Data	3
C	PTT	15
D	Data Clock	10
E	Mode	7
F	Tx Data	2

Push To Talk (PTT)

The interface signal Push To Talk (PTT) is asserted by the systems software to request a transmit clock from the SINCGARS radio. PTT is activated by asserting Request To Send (RTS) on the SCC (WR5 bit D1).

Clock Detect

The **ACB-188** implements a clock detect circuit that functions as a “missing pulse detector”. This utilizes a “one shot” circuit that generates a low or active signal on DCD when a clock is present, or when its connected to a device generating a 400 Hz or greater signal. A high or inactive signal will be present at DCD when no clock is detected (missing pulse) or a device generating a signal less than 400 Hz. The software can poll the status of DCD through Read Register 0 (RR0 bit D3) or program the SCC for External Status Interrupts and the 8530 will generate an interrupt every time DCD changes states.

Software Summary:

Once the proper cable connections have been made to the SINCGARS radio the software should program the SCC to interrupt on external status for DCD. This will allow the software to detect the presence of a clock signal. The software algorithm for transmit should allow RTS to be asserted if CTS is active. Once RTS is asserted the DCD input should be pulsing before the transmission is started. For receive, the DCD pin will be pulsing when the receive data stream is sent from the radio.