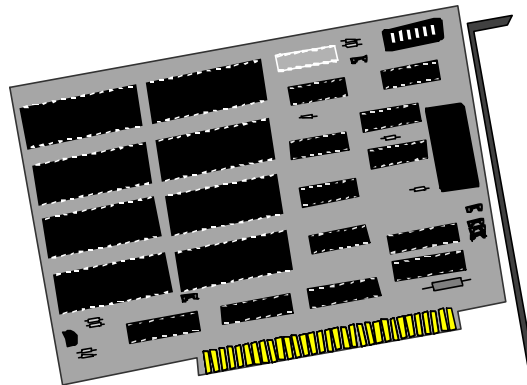


*PROM-III*TM
USER MANUAL



Part# 3070

Sealevel Systems, Inc.

155 Technology Place
P.O. Box 830
Liberty, SC 29657 USA

Phone: (864) 843-4343
FAX: (864) 843-3067
www.sealevel.com

Contents

INTRODUCTION	1
OVERVIEW	1
WHAT'S INCLUDED.....	1
FACTORY DEFAULT SETTINGS.....	1
CARD SETUP.....	2
ADDRESS SELECTION.....	2
ANNABOOKS PROMKIT SOFTWARE CONFIGURATION.....	4
INSTALLATION.....	6
TECHNICAL DESCRIPTION	7
EPROM Page Format	8
Software Examples	8
SPECIFICATIONS.....	9
ENVIRONMENTAL SPECIFICATIONS.....	9
MANUFACTURING.....	9
POWER CONSUMPTION	9
MEAN TIME BETWEEN FAILURES (MTBF)	9
PHYSICAL DIMENSIONS.....	9
APPENDIX A - TROUBLESHOOTING	10
APPENDIX B - HOW TO GET ASSISTANCE.....	11
APPENDIX C - SILK-SCREEN.....	12
APPENDIX D - SCHEMATIC	13
WARRANTY.....	15

Figures

Figure 1 - Address Selection Table.....	2
Figure 2 - Header E2, Device Selection.....	3
Figure 3 - Header E3 (Write Protect for Flash EPROMs).....	4
Figure 4 - Header E4, PROM-IIIB Jumpers	5
Figure 5 - EPROM Page Format Table.....	8

© 1999a Sealevel Systems, Incorporated. All rights reserved.

Introduction

Overview

The Sealevel Systems **PROM-III** uses bank switching procedures to supply the PC with access to 1 Meg of memory in a 16K footprint. The board can be populated with up to eight 128K x 8 EPROM (27C010), Flash EPROM (28F010), Static RAM, or Battery Backed RAM Modules. This memory can be utilized for Diskless operation of PCs, data storage areas, dedicated code, etc.

Designed to be compatible with *Annabooks PromKit*, the **PROM-III** when used in conjunction with *Promkit*, provides a turnkey solution for the embedded PC designer, allowing the use of low cost PCs in environments that would prove fatal to mechanical drives.

What's Included

The **PROM-III** is shipped with the following items. If any of these items are missing or damaged, contact the supplier.

- **PROM-III** Adapter
- PROM Software
- User Manual

Factory Default Settings

The **PROM-III** factory default settings are as follows:

Base Memory Location	Wait State
D000	Off

To install the **PROM-III** using factory default settings, refer to Installation on page 6.

For your reference, record installed **PROM-III** settings below:

Base Memory Location	Wait State

Card Setup

The **PROM-III** contains several jumper straps which must be set for proper operation.

Address Selection

You must select a base address for the board that does not conflict with any other EPROMs or PC memory areas. A DIP-switch (SW-1) is used to set the address. Some known conflicts are address C000:0 if you have EGA or VGA video, and address E000:0 through E000:FFFF (segment E) on some AT models. We recommend D000:0, however, this may conflict with extended memory. If you are using an Extended Memory Manager you should exclude the address area of the **PROM-III** in your command line.

Base Address	A14	A15	A16	A17
C000:0000	On	On	On	On
C400:0000	Off	On	On	On
C800:0000	On	Off	On	On
CC00:0000	Off	Off	On	On
D000:0000	On	On	Off	On
D400:0000	Off	On	Off	On
D800:0000	On	Off	Off	On
DC00:0000	Off	Off	Off	On
E000:0000	On	On	On	Off
E400:0000	Off	On	On	Off
E800:0000	On	Off	On	Off
EC00:0000	Off	Off	On	Off

Figure 1 - Address Selection Table

Note: Setting the switch on or closed corresponds to a '0' in the address, while leaving it off or open corresponds to a '1'.

Board Enable / Disable: The **PROM-III** can be enabled or disabled with switch position 2, marked 'EN', on the DIP-switch. The **PROM-III** is enabled with the switch 'On' or 'Closed' and disabled when 'Off' or 'Open'.

Wait State Generation: Closing the ‘W’ switch (position #1) generates a wait state to the PC Bus for every board access. This may be necessary when running in extremely fast machines that do not slow down to the (normal) 8 Megahertz (MHz) speed for bus accesses. This should not be necessary for most machines when utilizing 250 nano-second (ns) EPROMs. If you suspect a speed problem, try setting the ‘W’ switch ‘On’, or ‘Closed’.

Jumper E1: This header used only for Flash EPROMs. Be sure to remove this Jumper if you are using 27010 EPROMs or 128K RAMs.

Jumper Block E2: The **PROM-III** allows the use of 27010 EPROM, 28F010 Flash EPROM, 128K byte Static RAM, or battery backed RAM modules (Dallas Semiconductor part # DS1245Y). The jumpers on E2 provide for these options. The board is divided into two groups, socket U1 through U6, and U7 through U8. This provides a mixture of up to 768K bytes of EPROM (U1-U6), and up to 256K bytes of RAM (U7-U8) or vice-versa. The selection is made for Group 1 (U1-U6) by setting the top row of jumpers on E2 either all to the right for EPROM (and Flash), or all to the left for RAM (and battery backed modules). The selection for group two (U7-U8) is on the bottom row of E2, again, all jumpers to the right selects EPROM, and all jumpers to the left selects RAM. See the examples below:

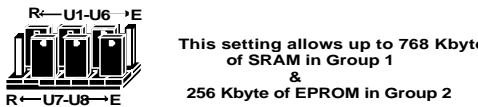
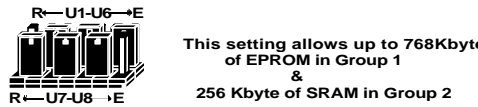


Figure 2 - Header E2, Device Selection

Jumper E3: used only if a 27010 EPROM (or 28F010 Flash) is installed in U1 and there is a need to protect it from being written to. This jumper prevents U1 from being erased and re-written during (Flash or RAM) program updates. Position 'A' is for Flash EPROM programming only, while position 'B' is for 27010 EPROMs, RAM Modules, and 'program-protecting' a Flash EPROM device.

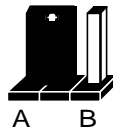


Figure 3 - Header E3 (Write Protect for Flash EPROMs)

Annabooks Promkit Software Configuration

To use the **PROM-III** with *Annabooks PromKit* Diskless EPROM Software, simply follow the initial *PromKit* instructions. The **PROM-III** default address should be set at address segment D000:0, the enable switch should be '**On**', or '**Closed**' and the wait state switch '**Off**', or '**Open**'. Note that the EPROM containing the file xxx.pk1 is placed in socket U1, xxx.pk2 is placed in socket U2, etc. If you are using the board to emulate two drives (group 1 and 2), be sure to follow the instructions carefully.

If using Flash EPROMs or SRAM software is supplied with the board to program Flash EPROMs or load the RAM with the *PromKit* files. The 'readme' file on the Sealevel **PROM-III** has instructions and examples for these operations.

Header E5: This header enables the on board battery for CMOS SRAM. It is very important to install this jumper after the CMOS SRAM is installed.

Note: Installing CMOS SRAM while a jumper is in place could result in damage to the CMOS SRAM!

Header E4: These jumpers are used in conjunction with E2 to determine if the board is configured for SRAM or EPROM. Please follow the examples below in configuring your board. The left column of pins on Header E4 control the chip selects for U1 through U6 and the right column control the chip selects for U7 and U8.

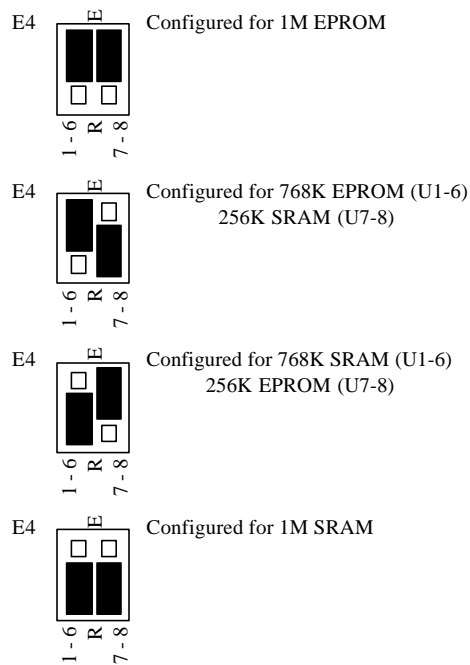


Figure 4 - Header E4, PROM-IIIB Jumpers

Note: Incorrectly setting E4 will result in damage to the battery!

E2 and E4 must correspond to EPROM and RAM memory selections, if they do not errors will be experienced in programming and reading data from EPROM / SRAM.

Installation

The **PROM-III** can be installed in any of the PC ISA expansion slots. The **PROM-III** contains several jumper straps for each port which must be set for proper operation prior to installing the adapter into the computer.

1. Identify an unused area of memory in which to install the **PROM-III**.
2. If you are using a memory manager (i.e. EMM386, QEMM386, Blue Max, etc.) exclude the memory area in which the **PROM-III** will reside.
3. Turn off PC power. Disconnect the power cord.
4. Remove the PC case cover.
5. Locate an available slot and remove the blank metal slot cover.
6. Gently insert the **PROM-III** into the slot. Make sure that it is seated properly.
7. Replace the screw.
8. Replace the cover.
9. Connect the power cord.

Installation is complete.

Technical Description

The Sealevel Systems **PROM-III** uses bank switching procedures to supply the PC with access to 1 Meg of memory in a 16K footprint. The board can be populated with up to eight 128K x 8 EPROM (27C010), Flash EPROM (28F010), Static RAM, or Battery Backed RAM Modules. The following description explains the basic operation of the board.

Assuming a board base address of D0000 Hex, each device (128K X 8) is broken down into 16 - 8K pages of data. The pages are accessed by writing an 'actual' bank # to D0000 - D1FFF Hex. The selected 8K page is then read from D2000 - D3FFF Hex. Please refer to Section 5, Software Considerations for programming examples.

The first 8K page of the first device (logical bank 0) is always accessed at D0000 - D1FFF Hex. This page could also be accessed by writing a 0 to D0000, and then reading locations D2000 - D3FFF Hex. The purpose of this architecture is to provide a common driver area (for automatically booting and initialization/driver code) and then up to 127 Bank Selected Pages of data. This is similar to the Lotus / Intel / Microsoft (LIM) Extended Memory Specification EMS.

If you are writing a specialized program, or driver to utilize the **PROM-III**, you need to know how to switch pages. If you are running an existing application, such as Promkit by Annabooks, you need not be concerned with the operation of the board.

EPROM Page Format

EPROM#	U1	U2	U3	U4	U5	U6	U7	U8
Address offset	Page	Page	Page	Page	Page	Page	Page	Page
0000-1FFF	00	10	20	30	40	50	60	70
2000-3FFF	01	11	21	31	41	51	61	71
4000-5FFF	02	12	22	32	42	52	62	72
6000-7FFF	03	13	23	33	43	53	63	73
8000-9FFF	04	14	24	34	44	54	64	74
A000-BFFF	05	15	25	35	45	55	65	75
C000-DFFF	06	16	26	36	46	56	66	76
E000-FFFF	07	17	27	37	47	57	67	77
10000-11FFF	08	18	28	38	48	58	68	78
12000-13FFF	09	19	29	39	49	59	69	79
14000-15FFF	0A	1A	2A	3A	4A	5A	6A	7A
16000-17FFF	0B	1B	2B	3B	4B	5B	6B	7B
18000-19FFF	0C	1C	2C	3C	4C	5C	6C	7C
1A000-1BFFF	0D	1D	2D	3D	4D	5D	6D	7D
1C000-1DFFF	0E	1E	2E	3E	4E	5E	6E	7E
1E000-1FFFF	0F	1F	2F	3F	4F	5F	6F	7F

Figure 5 – EPROM Page Format Table

Software Examples

Basic Examples: Base Address = D000:0

Read and print all data within the 8K driver bank:

```

DEF SEG = &HD000
FOR X=0 TO &H1FFF
PRINT PEEK(X);' ';
NEXT X
(OR)
DEF SEG = &HD200
FOR X=0 TO &H1FFF
PRINT PEEK(X);' ';
NEXT X
    
```

Read and print all data within the last 8K of the first EPROM:

```

DEF SEG = &HD000
POKE(0),&H0F `SET THE BANK # TO THE LAST ONE IN THE EPROM
DEF SEG = &HD200
FOR X=0 TO &H1FFF
PRINT PEEK(X);' ';
NEXT X
    
```

Specifications

Environmental Specifications

Specification	Operating	Storage
Temperature Range	0° to 50° C (32° to 122° F)	-20° to 70° C (-4° to 158° 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 U.L. 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	+5 VDC
Rating	160 mA

Mean Time Between Failures (MTBF)

Greater than 150,000 hours. (Calculated)

Physical Dimensions

Board length	6.5 inches	(16.51 cm)
Board Height including Goldfingers	4.2 inches	(8.89 cm)
Board Height excluding Goldfingers	3.9 inches	(8.13 cm)

Appendix A - Troubleshooting

By following these simple steps, most common problems can be eliminated without the need to call Technical Support.

1. Make sure the **PROM-III** is securely installed in a motherboard slot and is either enabled (first programming, or as the bootable device), or disabled (re-programming).
2. If using a memory manager, make sure the memory area where the **PROM-III** is residing has been excluded. For example if using the DOS memory manager, and the **PROM-III** is at memory address D000, the syntax would be: Device=EMM386.EXE X=D000.
3. If the trouble is in the flash programming, make sure the jumper at E3 is in the proper position ('A'), and that the jumper at E1 is installed (Vpp).
4. If the trouble is with the RAMs not holding memory after power down, make sure that the jumper at E5 (battery power) is closed, the jumpers at E2 and E4 are correctly set for rams and a battery is installed at location B1.
5. Make sure that the **PROM-III** memory address is not over lapping the memory address space of another device.

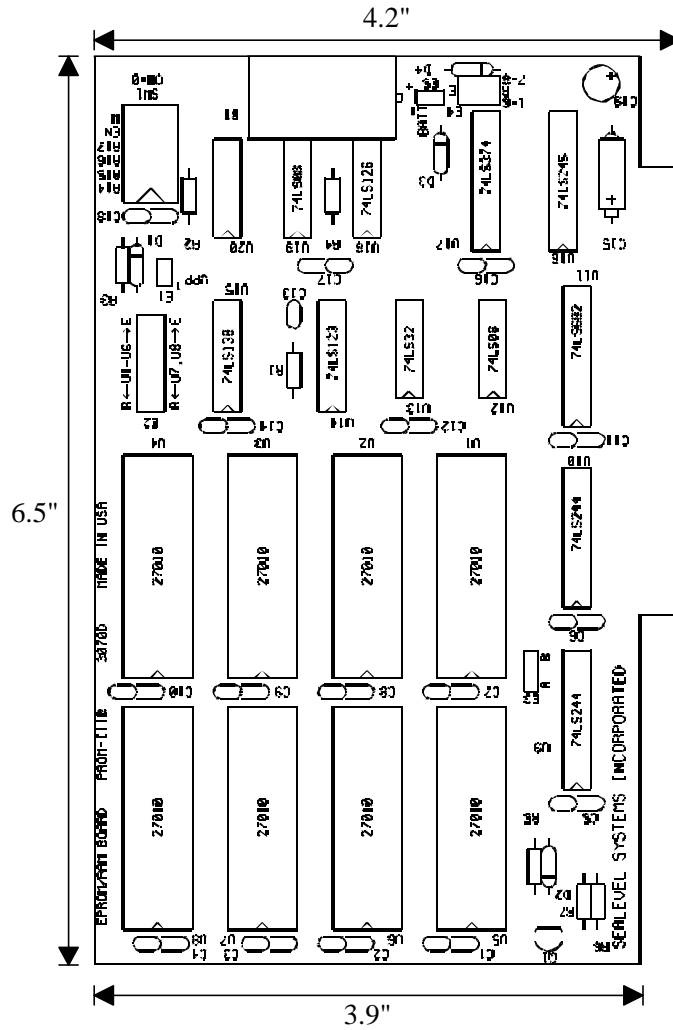
Appendix B - How To Get Assistance

Please refer to Appendix A - Troubleshooting 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. 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 - Silk-Screen



Appendix D - Schematic

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.

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.

Sealevel Systems, Incorporated
155 Technology Place
P.O. Box 830
Liberty, SC 29657 USA
(864) 843-4343 FAX: (864) 843-3067
www.sealevel.com
email: support@sealevel.com

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

Trademarks

Sealevel Systems, Incorporated acknowledges that all trademarks referenced in this manual are the service mark, trademark, or registered trademark of the respective company.

PROM-III is a trademark of Sealevel Systems, Incorporated.