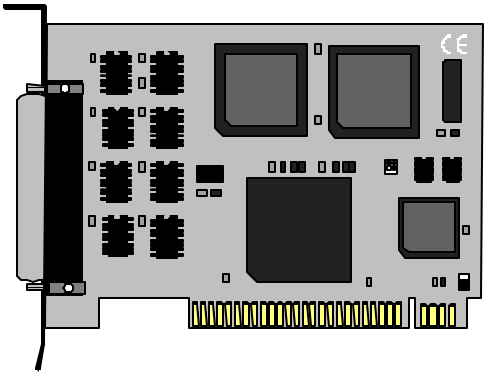
SEALEVEL
SYSTEMS INCORPORATED

EMC

USER'S MANUAL

Part Number 3077



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Introduction

Overview

The **EMC** provides a simple and reliable means for enhancing PC based embedded development. The **EMC** was developed specifically to address the flexibility and durability constraints engineers face when utilizing EPROM technology. The **EMC**'s design allows for maximum flexibility when utilized with embedded development products from Annabooks and Grammar Engine.

What's Included

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

- **EMC**
- User manual

Factory Default Settings

The **EMC** factory default settings are as follows:

SW1	SW2	E2
1-3, 5-6 On; 4 Off	**1-5 On**	**"C"**

To install the **EMC** using factory default settings, refer to Installation on page 7.

For your reference, record installed **EMC** settings below:

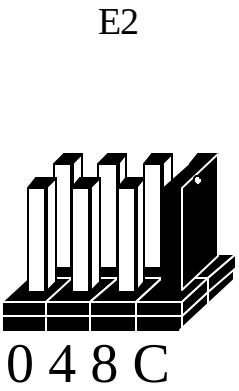
SW1	SW2	E2

Card Setup

The **EMC** contains several jumper straps for each port which must be set for proper operation.

Address Selection

The **EMC** base address is selected by Header E2. The base address selections are illustrated in Figure 1.



Header E2	Base Address Selected
0	00000H
4	40000H
8	80000H
C	C0000H

Figure 1 - Header E2, Base Address Selection (Factory Default)

Note: Addresses 00000H, 40000H and 80000H are normally occupied by system memory. The memory data transceivers on the system board should be disabled to avoid address contention if these addresses are used.

Device Type Selection

The **EMC** has four high quality, dual leaf 28-pin sockets that will accept EPROMs, SRAMs, or NVRAMs . DIP-switch SW1 positions C0 and C1 select the Device type the **EMC** will use. The device selection should be made prior to installing devices on the **EMC**, due to the fact that each of these devices will have a slightly different pin-out. The DIP-switch setting for the different memory devices supported are shown in the tables below.

The **EMC** will support chip sizes of 8Kx8, 16Kx8, 32Kx8, and 64Kx8.

Size	SW1 - "C0"	SW1 - "C1"
8Kx8	ON	ON
16Kx8	ON	OFF
32Kx8	OFF	ON
64Kx8	OFF	OFF

Figure 2 - Memory Size Selection Table

The EPROM/RAM base address is selected at E2 and the offset for each chip (according to size) is selected by DIP-switch SW1. Examples of these settings are found in the table below.

	Address Selection Bits			**Chip Locations (E2 set to "C")**			
Size	**A0**	**A1**	**A2**	**U1**	**U2**	**U3**	**U4**
8Kx8	On	On	On	C000	C200	C400	C600
8Kx8	On	On	Off	C800	CA00	CC00	CE00
8Kx8	On	Off	On	D000	D200	D400	D600
8Kx8	On	Off	Off	D800	DA00	DC00	DE00
8Kx8	Off	On	On	E000	E200	E400	E600
8Kx8	Off	On	Off	E800	EA00	EC00	EE00
8Kx8	Off	Off	On	F000	F200	F400	F600
8Kx8	Off	Off	Off	F800	FA00	FC00	FE00
16Kx8	On	On	On	C000	C400	C800	CC00
16Kx8	On	On	Off	D000	D400	D800	DC00
16Kx8	On	Off	On	E000	E400	E800	EC00
16Kx8	On	Off	Off	F000	F400	F800	FC00
32Kx8	Off	On	On	C000	C800	D000	D800
32Kx8	Off	On	Off	D000	D800	E000	E800
32Kx8	Off	Off	On	E000	E800	F000	F800
64Kx8	Off	Off	Off	C000	D000	E000	F000

Figure 3 - Address Selection Table

SW1 position “RW” indicates if a “write-able” device (SRAM or NVRAM) is installed in positions U1 to U4.

SW1 - “RW”	Function
Off	Read-only Devices
On	Write-able Devices

Figure 4 - Readable / Write-able Device Selection

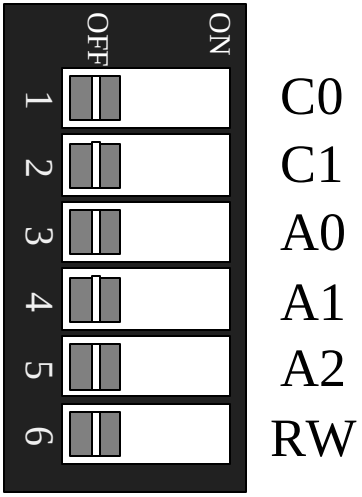
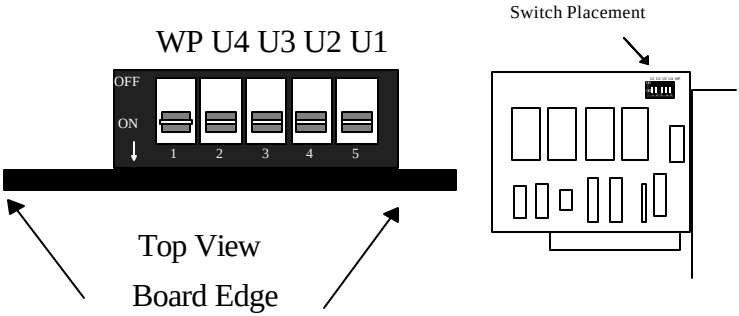


Figure 5 - DIP-Switch SW1 Illustration

Device Enable

Each Device on the **EMC** can be selectively enabled / disabled and the entire memory space write protected via DIP-switch SW2. This switch is mounted on the board edge for better accessibility during development. If a SRAM or NVRAM is used the switch labeled WP may be set "On" to fill or "Write" the devices and then set to "Off" after data is loaded. This will effectively "Write Protect" the contents of the devices from being inadvertently erased or corrupted.



Switch Position	On	Off
U1	Enables Device	Disables Device
U2	Enables Device	Disables Device
U3	Enables Device	Disables Device
U4	Enables Device	Disables Device
WP	Enables Devices to be Written	Disables Devices from being Written

Figure 6 - DIP-Switch SW2 Illustration

Compatible Devices for the EMC

The following is a partial list of compatible devices for the EMC. These devices can also be emulated using Grammar Engine products. The EMC supports only 28-pin JEDEC standard DIP packages.

EPROMS
2764
27128
27256
27512

SRAMS
61256

Note: 6264, 8K x 8 SRAMs are not compatible with the **EMC**, but can be emulated with the 61256, 32K x 8 SRAM. If 8Kx8 SRAMs are selected chip enables will change every 8K.

NVRAMS
DS 1225
DS 1235

The following are not supported by the EMC's sockets but can be emulated using Grammar Engine products.

EPROMS
27010
27020
.

Installation

The **EMC** can be installed in any of the PC expansion slots. The **EMC** contains addressing and device options which must be set prior to installation.

1. Turn off PC power. Disconnect the power cord.
2. Remove the PC case cover.
3. Locate an available slot and remove the blank metal slot cover.
4. Gently insert the **EMC** into the slot. Make sure the adapter is seated properly.
5. Replace the cover.
6. Connect the power cord.

Installation is complete.

Technical Description

The **EMC** provides the PC with a general purpose memory adapter, suitable for firmware, BIOS extensions, small disk emulation and Grammar Engine EPROM emulation for development. The **EMC** is PC compatible and fits any ISA or EISA slot. The adapter supports up to four 28-pin JEDEC standard memory devices ranging in density from 8Kx8 to 64Kx8, for a maximum capacity of 256 kilobytes. These memory devices may be EPROMS, SRAMS, or NVRAMS.

Features

- Supports four 28-pin Memory Devices for 256K Capacity

(See Section on Card Setup for compatibility list)

- Switch Selectable Address Boundaries
- Supports NVRAMs for non-volatile Read/Write Operation
- Standard "XT" size card for ease of integration

Programming Examples

A diskette providing sample software written in the "C" programming language is supplied with the **EMC**.

Specifications

Environmental Specifications

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

Power Consumption

Supply line	+5 VDC
Rating	160mA

Mean Time Between Failures (MTBF)

Greater than 150,000 hours. (Calculated)

Physical Dimensions

Board Length	5.24 inches	(13.30 cm)
Board Height including Goldfingers	4.2 inches	(10.66 cm)
Board Height excluding Goldfingers	3.9 inches	(9.906 cm)

Appendix A - Troubleshooting

1. Identify all adapters currently installed in your system that occupy adapter space memory addresses. This includes your on-board Video adapters, Expanded Memory Adapters and various ROM BIOS extensions.

2. Configure your Sealevel Systems adapter so that there is no conflict with currently installed adapters.

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

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 forum on CompuServe providing utilities and **EMC** information. This forum is accessed by typing "GO Sealevel" at the command prompt.
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 - Using Grammar Engine Products

ROMboy™ / PROMICE™

The EMC provides a 34-pin header that supports connection to Grammar Engine's ROMboy™ or PROMICE™ products via an optional ribbon cable (Grammar part number IDC 1234). These products provide ROM emulation and debugging capabilities for the developer. PROMICE™ and ROMboy™ can also connect to one of the EMC's ROM sockets using a cable included with ROMboy™ or PROMICE™ that terminates in a 28-pin DIP plug. The 34-pin header provides a more robust connection solution and allows emulation of all four of the EMC's ROMs (i.e. allowing a maximum size emulation of 256K versus 64K using the 28-pin DIP plug).

ROMboy™ and PROMICE™ are loaded and configured using LOADICE.EXE and operating parameters are specified in the LOADICE.INI file. If the 28-pin DIP cable provided from Grammar Engine is used in your application, the "socket" parameter should be setup for a 28-pin device (27512 in this example). The following is a sample LOADICE.INI file specifying COM1, 57.6K Baud, a single 64K ROM, 8-bit data width, and a download image file U1.DAT. Note that any ROMs installed in the EMC must be removed before using either cable connection to a Grammar Engine product.

```
output=com1
baud=57600
socket=27512
rom=64K
word=8
image=u1.dat
```

The size jumper on the ROMboy™ should be set to "28" pin. The EMC should be jumpered as follows to match this example. (64K device, C000, RW = OFF , SW2 U1 "On")

If the 34-pin ribbon cable is used to connect ROMboy™ or PROMICE™, the LOADICE.INI file "socket" parameter should be set for a 32-pin device (27010 in this example). The following is a sample LOADICE.INI file specifying COM1, 57.6K Baud, a 128K ROM space (comprised of the first two 64K ROM sockets), 8-bit data width, and a download image file U1_AND_2.DAT.

```
output=com1
baud=57600
socket=27010
rom=128K
word=8
image=u1_and_2.dat
```

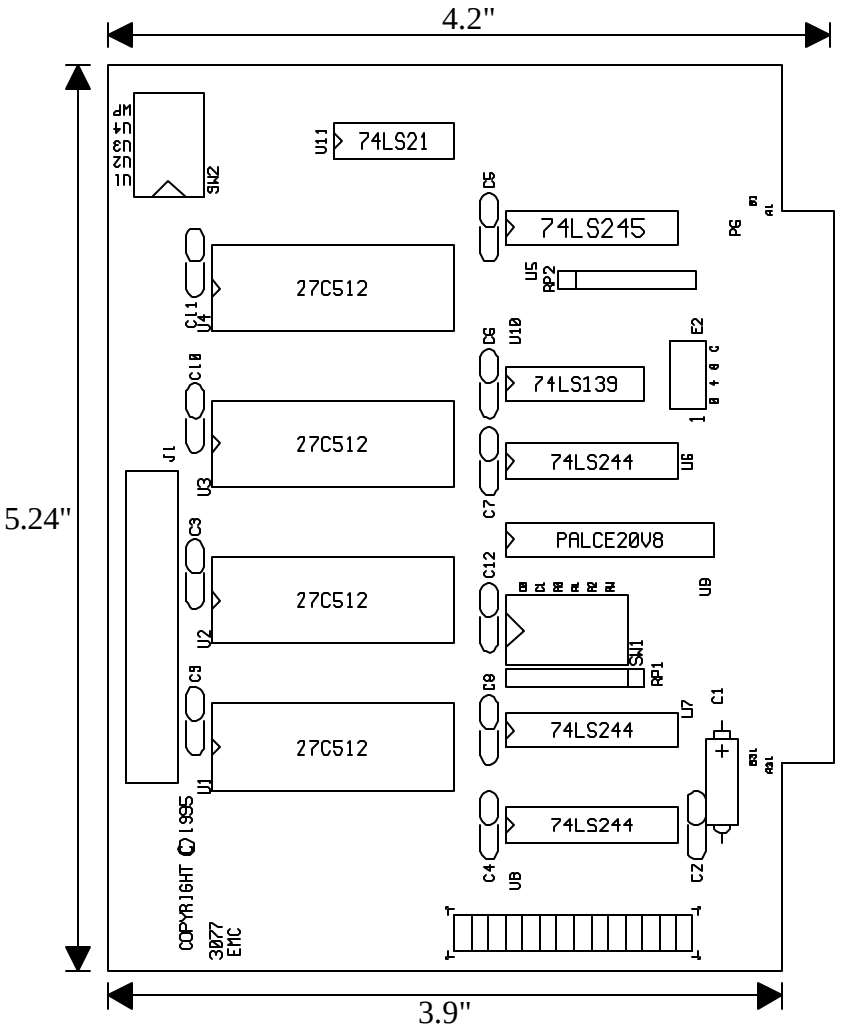
The size jumper on the ROMboy™ should be set to "32" pin. The EMC should be jumpered as follows to match this example. (64K device, C000, RW = OFF , SW2 U1 & U2 "On")

If the 32Kx8 devices at D000 are selected, the ROMboy™ or PROMICE™ images will need to be partitioned and loaded in a different order. The following example illustrates a bootable 128k image split into two separate files. This example uses the ROMboy™ to emulate four 32K devices. Note the separate image commands used to place the two binary images at appropriate offsets.

```
output=com1
baud=57600
socket=27010
word=8
image=c:\3077\test.pk2
image=c:\3077\test.pk1 0=10000
```

The size jumper on the ROMboy™ should be set to "32" pin. The EMC should be jumpered as follows to match this example. (32K device, C000, RW = OFF , SW2 U1 - U4 "On")

Appendix D - Silk-Screen



Appendix E - Schematic

Warranty

Sealevel Systems, Inc. warrants this product to be in good working order for a period of one year from the date of purchase. 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.

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Monday - Friday

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