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07-0026-01 February 1990

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Contents

1. Getting Started 1
2. Installation 3

Insertion of a PC-bus Card 4
Insertion of the EXP-AM 5
Running the EXM Configuration Program 6
3. Operation 7

Configuration Using BIOS Setup Screen 7
4. Programming Interface 9

5. Support and Service 11

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1. Getting Started

This manual contains the information you will need to install and use the EXP-AM PC-bus card adapter.

The EXP-AM is a mechanical holder for any 8-bit short PC card and an electrical interface between that card and the EXMbus. A "short" PC card is one no longer than six inches from the front panel to the rear card edge. To use the EXP-AM, you need two empty slots in your VMEbus chassis, and an EXMbus subplane that spans those two slots.

The EXP-AM itself is an EXMbus device, meaning that it has a unique device identifier recognizable by software, and an enable flag that allows software to enable or disable the EXP-AM and the PC-bus card within it. Because of this, the first time the system is used with a newly installed EXP-AM, the BIOS will detect a configuration error, and you will need to use the EXM configuration program (supplied with the EXP-AM) or the BIOS setup screen to inform the BIOS of the presence of the EXP-AM.

2. Installation

Before installing your EXP-AM, you should unpack and inspect it for shipping damage.

* do not remove the module from its anti-static bag unless you are in a static-free environment. the exp-am, like most other electronic devices, is susceptible to esd damage. esd damage is not always immediately obvious, in that it can cause a partial breakdown in semiconductor devices that might not immediately result in a failure.
* ensure that the installation process as described herein is also performed in a static-free environment.

An empty EXP-AM is shown below. The single integral unit contains a front panel, metal frame, and printed-circuit card. The front panel contains an opening through which the PC-bus card's connectors will appear after installation.

.G.EXPAM1.EPS;3.5";3.192";EPS

Insertion of a PC-bus Card

The following figure illustrates the insertion of the PC-bus card. With the EXP-AM in your right hand and the PC-bus card in your left, tip the PC card as shown to insert the top of its front panel through the wide opening in the EXP-AM front panel. If necessary, loosen the adjustable bracket on the EXP-AM's front panel.

.G.EXPAM2.EPS;2.7";3.756";EPS

Next, tilt the PC card forward so that its front panel is flush with that of the EXP-AM, so that the bottom of the PC card's front panel is above the slot on the backside of the EXP-AM's front panel, and so that the PC card's edge connector is positioned above the connector on the board in the EXP-AM.

Now, slide the PC card down, using reasonable force, into the connector. The bottom of the PC card's front panel should move into the slot. The unit should now appear as shown in the next figure. For extra rigidity, adjust the mounting bracket on the front panel to hold the PC-bus card in place.

.G.EXPAM3.EPS;2.7";3.756";EPS

Insertion of the EXP-AM

* make sure that power to your system is off. the exp-am is not designed to be inserted or removed from a live system.
* when inserting the exp-am, avoid touching the circuit board, and make sure the environment is static-free.

Insertion of the EXP-AM is straightforward. Its metal frame is designed to slide in card guides in two adjacent VMEbus slots. First ensure that you have an EXMbus subplane of adequate size installed in your system. The subplane needs to extend to or beyond the rightmost (for a vertical VME card cage) of the two slots the EXP-AM will occupy. The EXP-AM connects to the lower right subplane connector in the two VME slots.

Slide the EXP-AM into place, using enough pressure on the handles to seat the printed-circuit board into the connector on the subplane. The top and bottom mounting screws can be tightened to secure the module in the card cage.

Running the EXM Configuration Program

The EXM configuration program is intended primarily for EXMbus modules, and plays only a small role in the case of the EXP-AM. The configuration program stores information about the system configuration in the EPC's nonvolatile memory and is used by the EPC's BIOS at initialization time to configure all EXMs. The only configuration option of the EXP-AM is whether it is enabled.

To use the configuration program, you can execute it from the floppy diskette or first copy it from the floppy diskette to a hard disk. For instance, to execute it from the floppy diskette, put the diskette in your EPC and type

```
a:exmcfg
```

The configuration program must be executed on the EPC in which you've installed the EXP-AM. An alternative lower-level way to enter your configuration information via the EPC's BIOS setup screen is described in the next chapter.

The configuration program first displays a screen showing what devices appear to be physically present in each EXMbus slot, and what devices were previously described as being installed in each slot. Follow the instructions and select the slot in which your EXP-AM is installed. Note that the EXP-AM physically occupies four EXM slots, but logically occupies one - the slot corresponding to the lower right side of the EXP-AM. Depending on the subplane, this slot will be 2 or 4.

The next screen, specific to the EXP-AM, shows the only available choice - whether the EXP-AM is enabled or not. Typically you will choose enabled. The implications of disabling the EXP-AM are discussed in Chapter 4.

Follow the remainder of the instructions on the screen of the configuration program to save the specified configuration in the EPC's nonvolatile RAM. After this, every time you boot or reset your EPC, the BIOS will initialize the EXMs and EXP-AMs in the specified slots to the specified configuration.

3. Operation
Configuration Using BIOS Setup Screen
As an alternative to running the EXM configuration program, you can also establish the EXP-AM configuration via the BIOS setup screen. To invoke the setup program, depress CTRL+ALT+ESC at the operating-system prompt, or reboot your EPC, wait for the selftests to complete, and press CTRL+ALT+ESC. Once in the setup program, press the designated function key to invoke the EXM menu. On the screen you should see something like

EXM Setup Screen

	ID	OB1	OB2
Slot 0	FF	00	00
1	FF	00	00
2	7E	01	00
3	FF	00	00
4	FF	00	00
5	FF	00	00

This displays the data (in hexadecimal) stored in nonvolatile memory describing the EXM configuration. ID is the EXM's ID (the ID for EXP-AM is 7E, the ID for "no device expected" is FF). OB1 and OB2 are two bytes of option information. The EXP-AM uses OB1 but not OB2.
To add or change an EXP-AM configuration, the ID byte should be set to 7E for the slot in which the EXP-AM electrically resides (typically 2 or 4), and OB1 should be set to 01 (to enable the EXP-AM) or 00 (to disable it).

4. Programming Interface

Except for its ability to be enabled and disabled, the EXP-AM is transparent to software (although the PC-bus card added to the EXP-AM typically is not). The EXP-AM defines the following registers in the I/O space:

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	I/O port
0	1	1	1	1	1	1	0	

100
Device ID Register

CDEN

102
Configuration Option Byte 1 Register

These are standard EXM registers for device identification and configuration. The EXP-AM responds to accesses to these ports only if EXMbus line -EXMID is asserted to the EXP-AM's electrically connected slot. An 8-bit read from I/O address 100h returns the value 7E, the device ID of the EXP-AM. A read/write configuration register appears at I/O address 102h. All bits are interpreted as 1 except CDEN, which specifies whether the EXP-AM is disabled (0) or enabled (1). If disabled,

ù The EXP-AM will respond only to reads at I/O port 100h and reads and writes at I/O port 102h, and then only if EXMbus line -EXMID is asserted.

ù The PC-bus card in the EXP-AM is essentially deactivated. The following signals to the PC-bus card are held inactive: -SMEMR, -SMEMW, ÄIOR, ÄIOW, -DACK1, -DACK2, -DACK3. The following signals from the PC-bus card are electrically disconnected from the rest of the system: IRQ2(9), IRQ3, IRQ4, IRQ5, IRQ6, and IRQ7.

ù The state of all other signals is unaffected. Of these, D0..D7, IOCHRDY, ÄIOCHCK, DRQ1, DRQ2, and DRQ3 are not buffered, and all others are buffered by logic on the board in the EXP-AM.

5. Support and Service
If you have questions or problems, call 800-950-0044 between the hours of 8 AM and 5 PM Pacific time. Technical support is provided for users who purchased their system from RadiSys or a RadiSys sales representative; if you purchased your system elsewhere, you should contact that party for support.
Repair
Repair service under the standard warranty is provided to the original purchaser. Products returned for warranty repair that are found to be fully functional will be subject to a recertification fee. Typical turnaround time for repair and recertification is five working days (exclusive of shipping time).
Out-of-warranty service is subject to a service charge. After the damaged product is analyzed, the customer will be given a cost estimate and asked for authorization to proceed. All repairs are warranted for 90 days.
Shipping
Products requiring service may be returned to RadiSys, shipping prepaid, after issuance of a return materials authorization (RMA). Return authorization may be obtained by calling customer service (800-950-0044) with the product model, serial number, and problem description. Proper packaging, preferably the original shipping containers, should be used. Be sure to use anti-static and padded packaging, and to include a written description of the problem. The customer assumes all liability for loss or damage in transit in both directions. Unless otherwise agreed in advance, products will be returned to the customer with shipping and any repair charges due on delivery.
Ship the product needing service, freight prepaid, to:

Product Service Center
RadiSys Corporation
19545 NW Von Neumann Drive
Beaverton, OR 97006 USA
Other Services
Modifications to the warranty and repair services are available, including
· Overnight (express) shipment
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· Extensions to the warranty period.

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