Reference Manual

EPM-VID-3

SVGA Module for the
PC/104-*Plus* Bus

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Product Release Notes

> This page includes recent changes or improvements that have been made to this product. These changes may affect its operation or physical installation in your application. Please read the following information.

Rev 2 Release

- Beta public release.

Support Page

The **EPM-VID-3 Support Page**, at **http://www.versalogic.com/private/epmvid3support.asp**, contains additional information and resources for this product including:

- Reference manual (PDF)
- Operating system information and software drivers
- Data sheets and manufacturers' links for chips used in this product
- BIOS information and upgrades
- Utility routines and benchmark software

Note: This is a private page for EPM-VID-3 users only. It cannot be reached through our Web site. You must enter this address directly to find the support page.

Model EPM-VID-3
SVGA Model for the
PC/104-*Plus* Bus

REFERENCE MANUAL

Notice:

Although every effort has been made to ensure this document is error-free, VersaLogic makes no representations or warranties with respect to this product and specifically disclaims any implied warranties of merchantability or fitness for any particular purpose.

VersaLogic reserves the right to revise this product and associated documentation at any time without obligation to notify anyone of such changes.

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Table of Contents

Introduction 1

Description

The EPM-VID-3 model is a high speed SVGA interface for PC/104-*Plus* systems. It is fully compatible with popular operating systems such as QNX; Windows 95/98, 2000, CE, NT and XP; Linux; and VXWorks.

The video section features outputs for standard display monitors and LVDS flat panel displays. A wide selection of operating modes allows the display to be tailored to a variety of OEM requirements.

Eight MB of on-board video RAM (standard) allows color depths up to 32-bits and screen resolutions up to 1600 x 1200 pixels.

The EPM-VID-3 features high-reliability design and construction and 100% functional testing. It is backed by a two-year limited warranty and VersaLogic's outstanding service and support. The EPM-VID-3 is a PC/104-*Plus* compliant Super VGA display module with a single chip VGA controller, 8 MB of VRAM and flat panel support.

- High-Speed PC/104-*Plus* PCI interface
- Fully SVGA compatible
- Standard analog video monitor support
- LVDS flat panel display support

- 8 MB VRAM
- 1600 x 1200 resolution with 32-bit color
- Windows 95/98, 2000, NT and XP

VGA/SVGA CONTROLLER AND ROM BIOS

A single ATi Rage Mobility VGA controller chip provides VESA-standard VGA and SGVA graphics modes and registers. The circuitry can output displays of up to 1600 x 1200 pixels in 32-bit color. Custom BIOS support can be added to allow the use of VGA and SVGA Flat Panel Displays.

SOFTWARE DRIVERS AND UTILITIES

- Performance-enhanced VGA drivers for Windows 95/98, 2000, NT and XP
- Drivers are also available from the EPM-VID-3 Product Support Web page at: http://www.versalogic.com/private/epmvid3support.asp

Technical Specifications

Specifications are typical at 25° C with 5.0 V supply unless otherwise noted.

Board Size:
 3.55" x 3.775" (PC/104 standard)

Storage Temperature:
 –40° C to 85° C

Free Air Operating Temperature:
 0° C to 60° C

Power Requirements:
 EPM-VID-3 +5 V ±5% @ 475 ma (Typical, Win 98, analog output at any resolution)

Video Controller:
 ATi Rage Mobility video controller

Video RAM:
 8 MB standard

Video Modes (resolution, maximum color depth):
 640 x 480, 32-bit color
 800 x 600, 32-bit color
 1024 x 768, 32-bit color
 1280 x 1024, 32-bit color
 1600 x 1200, 32-bit color

Video Outputs:
 Standard SVGA analog
 LVDS flat panel drive
 NTSC TV output

Video BIOS:
 64 KB at address C0000h

Video BIOS Compatibility:
 X86-compatible processor with PCI-compatible BIOS

External Connectors:
 Analog VGA: 12-pin 2 mm latching header
 Flat Panel: 20-pin flat panel LVDS header
 TV-Out: 10-pin 2 mm latching header

Bus Compatibility:
 PC/104 (pass-through)
 PC/104-*Plus*

Specifications are subject to change without notice.

Technical Support

If you have problems that this manual cannot help you solve, first visit the EPM-VID-3 Product Support Web page at **http://www.versalogic.com/private/epmvid3support.asp**. If you have further questions, contact VersaLogic for technical support at (541) 485-8575. You can also reach our technical support engineers via email at Support@VersaLogic.com.

EPM-VID-3 Support Web Site

http://www.versalogic.com/private/epmvid3support.asp

REPAIR SERVICE

If your product requires service, you must obtain a Returned Material Authorization (RMA) number by calling (541) 485-8575.

Please provide the following information:

- Your name, the name of your company and your phone number
- The name of a technician or engineer who we can contact if we have questions
- Quantity of items being returned
- The model and serial number (barcode) of each item
- A description of the problem
- Steps you have taken to resolve or repeat the problem
- The return shipping address

Warranty Repair	All parts and labor charges are covered by a standard manufacturer's warranty period of two years, including return shipping charges for UPS Ground delivery to United States addresses.
Non-Warranty Repair	All non-warranty repairs are subject to diagnosis and labor charges, parts charges and return shipping fees. We will need to know what method you prefer for return shipping to your facility and secure a purchase order number for invoicing the repair.
Note	Please mark the RMA number clearly on the outside of the box before returning. Failure to do so can delay the processing of your return.

Configuration / Operation

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Overview

ELECTROSTATIC DISCHARGE

Warning!   Electrostatic discharge (ESD) can damage boards, disk drives and other components. The circuit board must only be handled at an ESD-safe workstation. If an approved station is not available, some measure of protection can be provided by wearing a grounded anti-static wrist strap. Keep all plastic away from the board, and do not slide the board over any surface.

After removing the board from its protective wrapper, place the board on a grounded, static-free surface with the component side facing up. Use an anti-static foam pad if available.

The board should also be protected during shipment or storage by keeping it inside a closed metallic anti-static envelope.

Note   The exterior coating on some metallic anti-static bags is sufficiently conductive to cause excessive battery drain if the bag comes in contact with the bottom side of the EPM-VID-3.

Physical Dimensions

The EPM-VID-3 complies with all PC/104-*Plus* standards. Dimensions are given below to help with preproduction planning and layout.
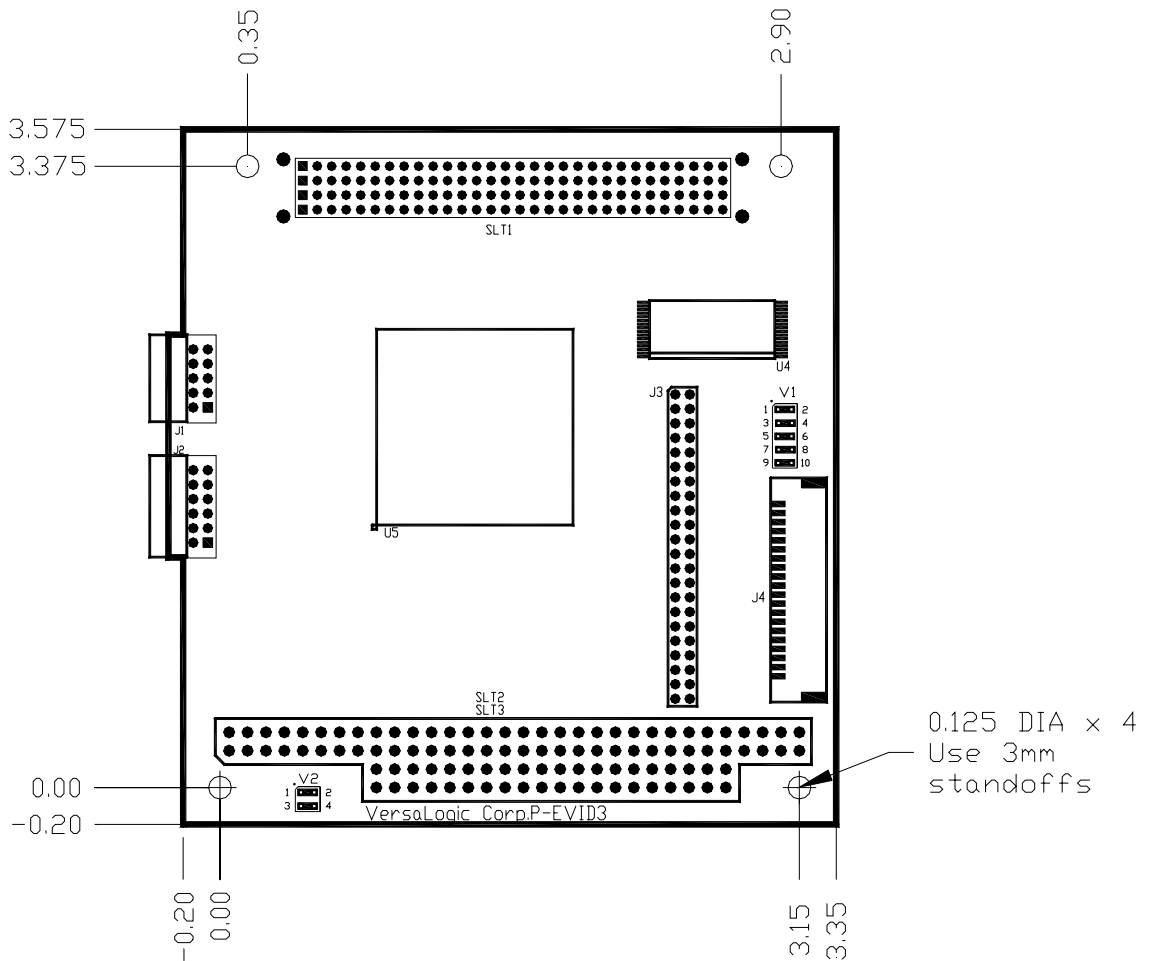
Figure 1. Dimensions

(Not to scale. All dimensions in inches.)

HARDWARE ASSEMBLY

The EPM-VID-3 uses pass-through PC/104 connectors so that expansion modules can be added to the top or bottom of the stack, PC/104 (ISA) modules and any PC/104-*Plus* (PCI) modules on the stack.

The entire assembly can sit on a tabletop or be secured to a base plate. When bolting the unit down, secure all four standoffs to the mounting surface to prevent circuit board flexing. Standoffs are secured to the top circuit board using four pan head screws. Refer to the drawing on page 5 for dimensional details.

An extractor tool is available (part number VL-HDW-201) to separate the modules from the stack.

Arranging the PC/104-*Plus* Stack

1. Turn the system power off.
2. Install the EPM-VID-3 module in stack position 0, 1, 2 or 3.
3. Ensure that jumper V2 matches the chosen stack position (see *Jumper Summary* on page 10).
4. Additional stack-through modules can be stacked on top of the EPM-VID-3. Up to three more PC/104-*Plus* modules and/or six regular PC/104 modules can be added.

Warning!   Installing or removing modules from the PC/104-*Plus* stacks while the power is on may damage the system.

Note   The EPM-VID-3 module is designed to work with PC/104-*Plus* CPU boards. It does not operate with regular PC/104 stacks (without the PCI connector).
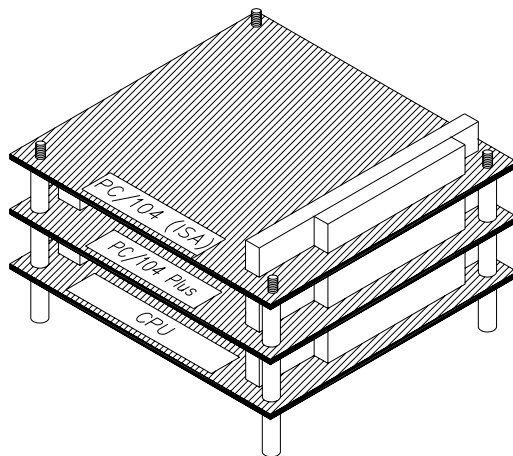
STACK ARRANGEMENT

Figure 2. PC/104 Card Added to Top of Stack

External Connectors

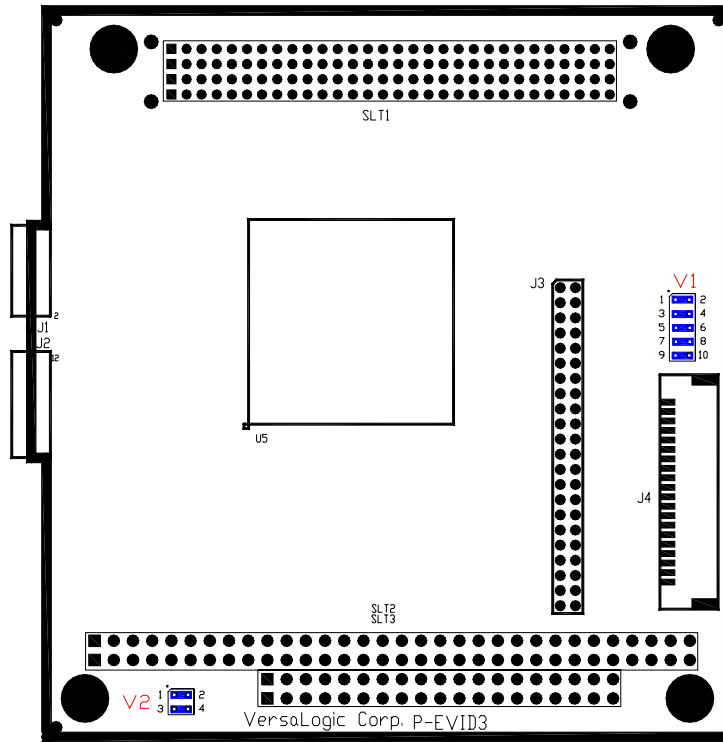## CONNECTOR LOCATION DIAGRAMS

Figure 3. Connector Location Diagram

CONNECTOR FUNCTIONS AND INTERFACE CABLES

The table below notes the function of each connector, as well as mating connectors and cables, and the page where a detailed pinout or further information is available.

Table 1: Connector Functions and Interface Cables

Connector	Function	Mating Connector	Transition Cable	Cable Description	Page	‡Pin 1 Location X Coord.	Y Coord.
J1	TV Output	FCI 89361-710	VersaLogic VL-CBL-1010	12" 10-pin IDC to S-Video/composite	13	-0.65	2.065
J2	SVGA Output	FCI 89361-712	VersaLogic VL-CBL-1201	12" 12-pin IDC to mini DB-15F	11	-0.65	1.330
J3	Reserved – not installed				–	2.475	2.135
J4	LVDS	Molex 51146-2000	VersaLogic VL-CBL-2010	18-bit LVDS flat panel video to Hirose connector	12	N/A	N/A
			VersaLogic VL-CBL-2011	18-bit LVDS flat panel video to JAE connector			

‡ **Note:** Relative to lower left hand mounting hole. See page 5.

Jumper Block Locations

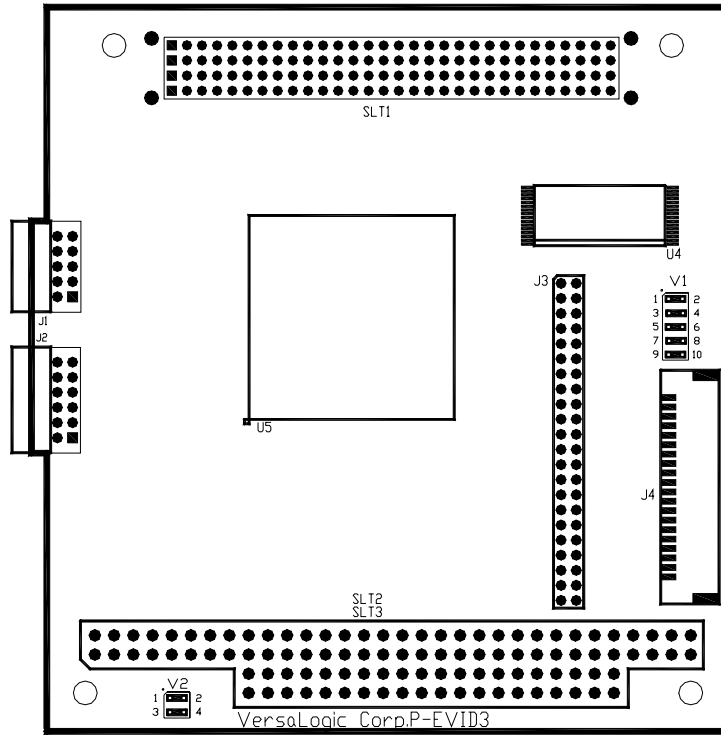**Note**   Jumpers are shown in as shipped configuration.

Figure 4. Jumper Block Locations

JUMPER SUMMARY

Table 2: Jumper Summary

Jumper Block	Description						As Shipped	Page
V1	**Video BIOS/Panel Selection**						CRT and TV output only	11
	V1[1-2]	**V1[3-4]**	**V1[5-6]**	**V1[7-8]**	**V1[9-10]**	**Type**		
	In	In	In	In	In	CRT and TV output only		
	In	In	Out	In	In	800x600 18-bit LVDS		
	In	In	In	Out	In	1024x768 18-bit LVDS		
	Out	In	In	In	In	CRT and TV output only		
	Out	In	Out	In	In	800x600 24-bit LVDS		
	In	Out	In	In	In	CRT and TV output only		
	In	Out	Out	In	In	1024x768 24-bit LVDS		
V2	**PC/104-*Plus* Bus Configuration**						0	6
	V2[1-2]	**V2[3-4]**				**Module Position**		
	In	In				0		
	Out	In				1		
	In	Out				2		
	Out	Out				3		

Connecting the Video Display

Any standard VGA monitor or flat panel display that uses SVGA control signals may be connected to the EPM-VID-3. Adapter cable VL-CBL-1201 is used to convert the dual-row connector J2 to a standard 15-pin mini-D connector.

See the *Connector Location Diagram* on page 7 for connector location information.

Warning!   Do **not** connect or disconnect a monitor from the EPM-VID-3 while the module power is on.

SVGA OUTPUT

A 12-pin header connector at J2 provides the SVGA output signals.

Table 3: SVGA Output Pinout

J2 Pin	Signal Name	Description	Mini DB15 Pin
1	GND	Red ground	6
2	CRED	Red video	1
3	GND	Green ground	7
4	CGRN	Green video	2
5	GND	Blue ground	8
6	CBLU	Blue video	3
7	GND	Digital ground	5
8	CHSYNC	Horizontal sync	13
9	SGND	Sync return (digital ground)	10
10	CVSYNC	Vertical sync	14
11	DDC2C	Auto configuration input	15
12	DDC1D	Auto configuration input	12
N/C	N/C	No connect	4
N/C	NC	No connect	9
N/C	N/C	No connect	11

LVDS FLAT PANEL DISPLAY CONNECTOR

The integrated LVDS Flat Panel Display in the EPM-VID-3 is an ANSI/TIA/EIA-644-1995 specification-compliant interface. It can support up to 24 bits of RGB pixel data plus 3 bits of timing control (HSYNC/VSYNC/DE) on the four differential data output pairs. The LVDS clock frequency ranges from 25 MHz to 85 MHz. Adapter cable VL-CBL-2010 or VL-CBL-2011 can be used to connect J4 to the flat panel display connector.

The 3.3 V power provided to pins 19 and 20 of J4 is protected by a 1 Amp fuse.

See the *Connector Location Diagram* on page 7 for connector location information.

Table 4: LVDS Flat Panel Display Pinout

J4 Pin	Signal Name	Function	Hirose or JAE Connector
1	GND	Ground	20
2	NC	No Connection	19
3	LVDSA3	Diff. Data 3 (+)	18
4	LVDSA3#	Diff. Data 3 (−)	17
5	GND	Ground	16
6	LVFSCLK0	Differential Clock (+)	15
7	LVDSCLK#	Differential Clock (−)	14
8	GND	Ground	13
9	LVDSA2	Diff. Data 2 (+)	12
10	LVDSA2#	Diff. Data 2 (−)	11
11	GND	Ground	10
12	LVDSA1	Diff. Data 1 (+)	9
13	LVDSA1#	Diff. Data 1 (−)	8
14	GND	Ground	7
15	LVDSA0	Diff. Data 0 (+)	6
16	LVDSA0#	Diff. Data 0 (−)	5
17	GND	Ground	4
18	GND	Ground	3
19	+3.3V	Protected Power Supply	2
20	+3.3v	Protected Power Supply	1

TV OUTPUT CONNECTOR

The TV output interface is in a standard NTSC compatible format. The connector J1 can accommodate either a standard composite signal connector (typically an RCA type connector), or an S-Video DIN connector. Both of these connectors are on the VersaLogic CBL-1010 interface cable.

The NTSC format is a low resolution format intended for non-GUI uses. Selected VGA screen resolutions above the NTSC resolution of about 512 x 350 (depending on the quality of the video monitor) will tend to look fuzzy on the TV monitor. The video chip on this board scales the selected VGA resolution to the NTSC resolution format. When scaling from a higher resolution (such as the default 800 x 600 Windows format) to the lower NTSC format, much of the video information is lost, resulting in a hard to read screen. Even the standard DOS level video format of 640 x 480 will show some image degradation due to the scaling. Crisp TV Output can only be obtained when scaling from a lower VGA resolution, such as 320 x 200.

See the *Connector Location Diagram* on page 7 for connector location information.

Table 5: TV Output Pinout

J1 Pin	Function
1	GND
2	Y-S Video
3	GND
4	C-S Video
5	GND
6	Composite Video
7	GND
8	SYNC
9	GND
10	GND

Software Installation

Drivers are available EPM-VID-3 Product Support Web page at: http://www.versalogic.com/private/epmvid3support.asp. The purpose of these software drivers is to provide the most current driver versions to Windows users.