

OPERATIONS MANUAL PCM-VGA

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REVISION HISTORY

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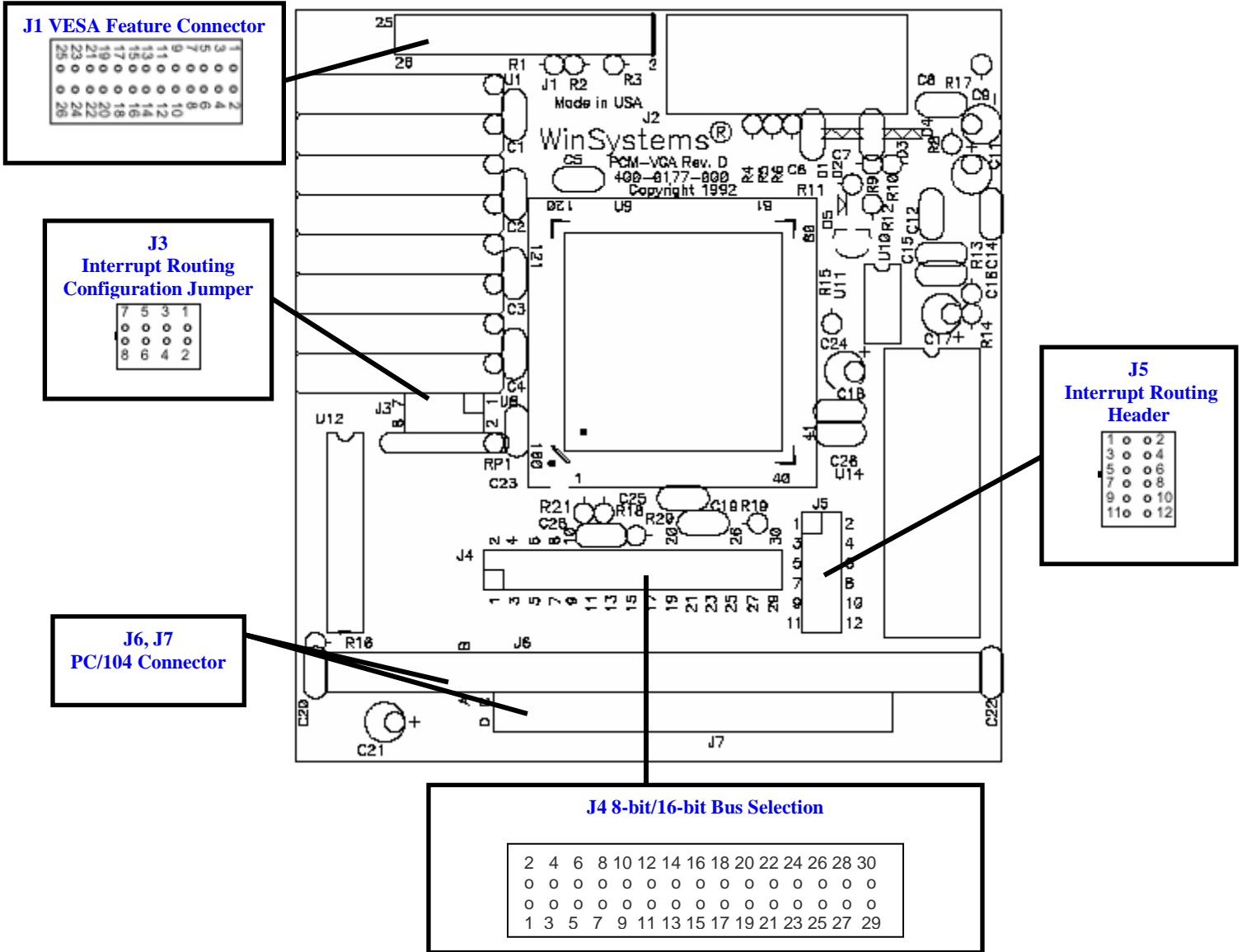
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Warranty and Repair Information

Visual Index – Quick Reference

For the convenience of the user, a copy of the Visual Index has been provided with direct links to connector and jumper configuration data.



1 General Information

1.1 Features

- Based on Cirrus Logic GD5420 Super VGA Controller Chip
- 100% Hardware compatible with IBM VGA display standards
- Industry Standard VGA BIOS
- PC/104 Standard stack through module
- Up to 1Mb Display memory Supported
- 16-Bit PC/104 I/O Option
- VESA Compliant Pass through Feature Connector
- 132 column Text mode support
- Extended SVGA modes through 1024 X 768 and 256 Colors with 1MB installed.
- On Board EEPROM stores monitor information.

1.2 General Description

The PCM-VGA is a high resolution, Super VGA PC/104 video display module that provides low cost standard VGA with the capability of extended Super VGA modes of up to 1024 X 768 with 256 colors. The PCM-VGA is based on the Cirrus Logic GD5420 Chip which is the latest in a long line of successful VGA controllers. This experience provides the benefit of a highly compatible product with a wealth of SVGA drivers for all of the most popular applications.

1.3 Specifications

1.3.1 Electrical

Bus Interface : PC/104 8-Bit
PC/104 16-Bit (optional)

VCC: +5v +- 5% @ 250mA with 256K RAM.

1.3.2 Mechanical

Dimensions: 3.6" x 3.8" X 0.6"

PC-Board : FR-4 epoxy glass with 2 signal layers and 2 power planes with component legend, and plated through holes.

Jumpers : 0.025" square posts on 0.10" centers.

1.3.3 Connectors :

Analog VGA : DB15F

Feature Connector : 26 Pin RN type IDH-26-LP

1.3.4 Environmental

Operating Temperature : -40° to +85° C

Non-Condensing Humidity : 5 to 95%

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PCM-VGA Technical Reference

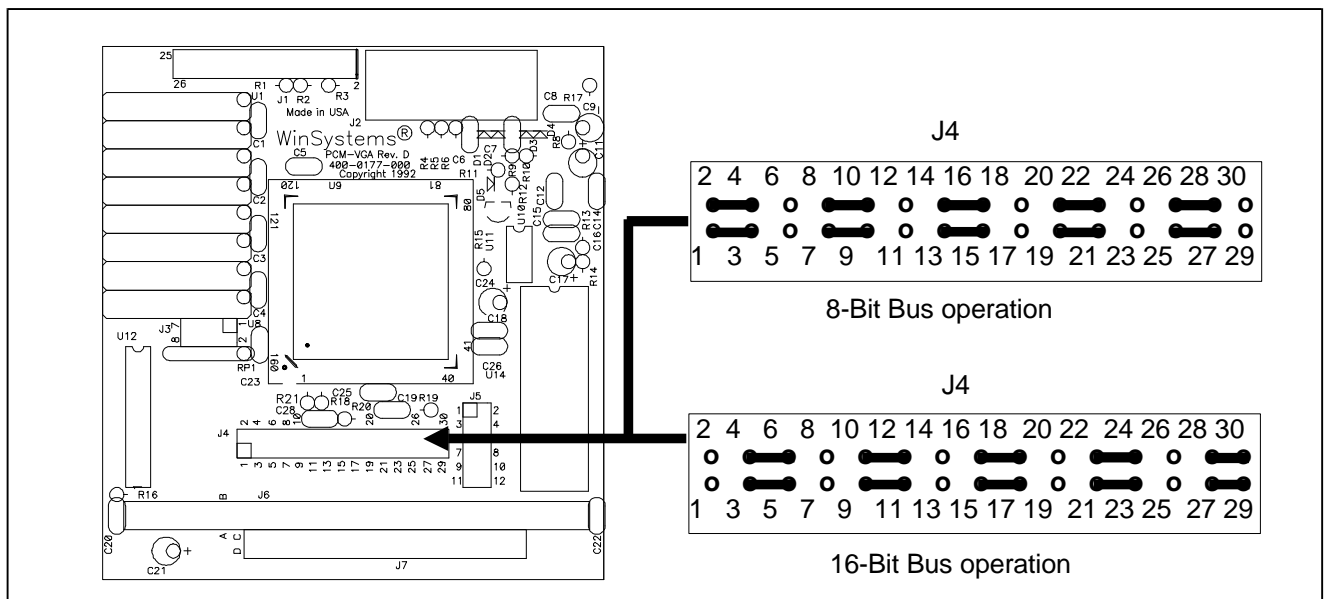
2.1 Introduction

This section of the manual provides information regarding installation and configuration of the PCM-VGA module. Questions or problems using the PCM-VGA board should be addressed to the WinSystems Technical Support department at (817) 274-7553 between 8:00AM and 5:00PM Central time. Alternately assistance can be obtained via FAX at (817) 548-1358.

2.1.1 Installation

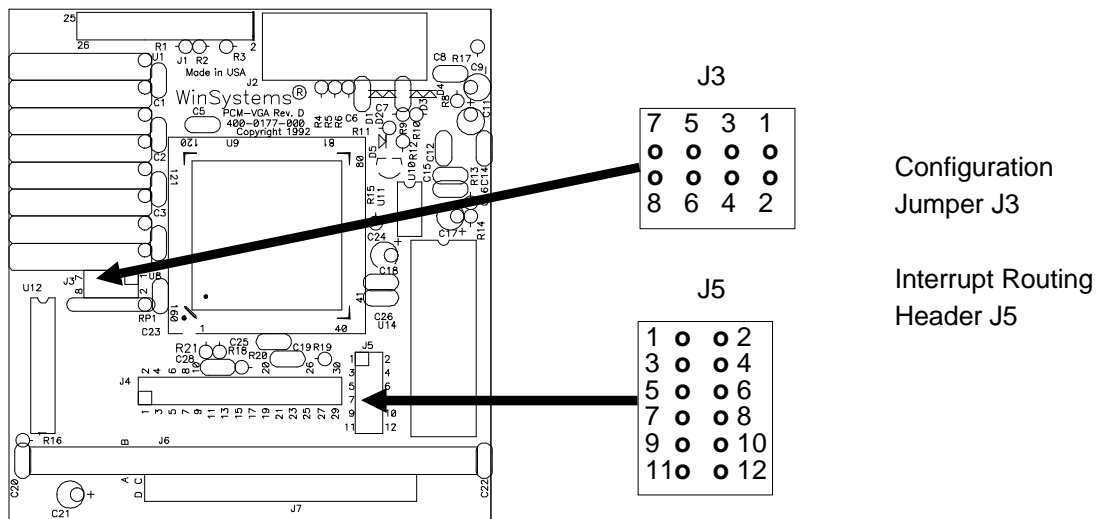
The PCM-VGA module conforms to the PC/104 standard for a stack through module and may be placed in any position in the stack. Any user configuration jumpering should be accomplished prior to installation, as the jumper posts may not be accessible if installed between other modules.

2.2 8/16-Bit Bus Selection

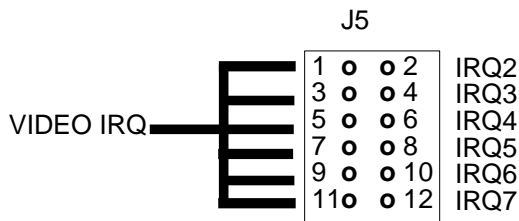


The PCM-VGA may be used in PC/104 bus systems utilizing either 8-bit or 16-bit accesses to the VRAM array. An optional connector at J7 is installed for connection to a PC/104 16-Bit system. This option is not required for connection to a 16-bit system but may result in improved video throughput if installed and enabled. To enable the 16-Bit functionality J4 must be jumpered for 16-bit operation as shown above.

2.3 Interrupt Routing



The PCM-VGA is capable of generating a retrace interrupt compatible with EGA systems. This interrupt is not used with VGA software but is provided only for compatibility with EGA software requiring it or for user software. When used for EGA compatibility J5 is jumpered 1-2. Alternate interrupt routing options can be made using the following diagram as a guide.



2.4 Wait State Control

In order to further improve video response time, pins 1-2 on J3 may be jumpered to enable the "0 wait state mode" this mode when enabled will allow 0 wait state Display memory writes if the internal write buffer is not full and 0 wait state BIOS ROM reads if enabled by an internal register. This position is unjumpered from the factory and it is the responsibility of the user to determine if enabling this option will result in a reasonable performance increase without a significant degradation in reliability. Most CPU boards allow SHADOWING of the BIOS ROM into system RAM which will be many times faster than even the "0 wait state" option, and the on-board write ahead FIFO causes most video display writes to be executed with minimal delay.

2.5 Supported Video Modes

The actual video modes available are dependent on the amount of RAM installed on the video module and the capability of the attached monitor. Running the optional CLmode utility allows determination of allowable modes and monitor usability. There is a monitor compatibility chart also provided in Appendix A. The following table defines the various modes available and the memory requirement for each.

Video Mode	Screen Format	No.of Colors	Display Mode	Char. Cell	Pixel Freq. Mhz.	Horiz. Freq. kHz	Vert. Freq. Hz.	Memory Required
0,1	360 X 400	16/256K	Text	9 X 16	14	31.5	70	256KB
2,3	720 X 400	16/256K	Text	9 X 16	28	31.5	70	256KB
4,5	320 X 200	4/256K	Graphics	8 X 8	12.5	31.5	70	256KB
6	640 X 200	2/256K	Graphics	8 X 8	25	31.5	70	256KB
7	720 X 400	Mono	Text	9 X 16	28	31.5	70	256KB
D	320 X 200	16/256K	Graphics	8 X 8	12.5	31.5	70	256KB
E	640 x 200	16/256K	Graphics	8 X 14	25	31.5	70	256KB
F	640 X 350	Mono	Graphics	8 X 14	25	31.5	70	256KB
10	640 X 350	16/256K	Graphics	8 X 14	25	31.5	70	256KB
11	640 x 480	2/256K	Graphics	8 X 16	25	31.5	60	256KB
12	640 X 480	16/256K	Graphics	8 X 16	25	31.5	60	256KB
12+	640 X 480	16/256K	Graphics	8 X 16	31.5	37.9	72	256KB
13	320 X 200	256/256K	Graphics	8 X 8	12.5	31.5	70	256KB
14	1056 X 400	16/256K	Text	8 X 16	41.5	31.5	70	256KB
54	1056 X 350	16/256K	Text	8 X 8	41.5	31.5	70	256KB
55	1056 X 350	16/256K	Text	8 X 14	41.5	31.5	70	256KB
58,6A	800 X 600	16/256K	Graphics	8 X 16	36/40/50	35.2/37.8 48.1	56/60/72	256KB
5C	800 X 600	256/256K	Graphics	8 X 16	36/40/50	35.2/37.9 48.1	56/60/72	512KB
5D	1024 X 768	16/256K	Graphics	8 X 16	65/75/77	48.3/56 58	60/70/72	512KB
5F	640 X 480	256/256K	Graphics	8 X 16	25/31.5	31.5/37.9	70/72	512KB
60	1024 X 768	256/256K	Graphics	8 X 16	65/75/77	48.3/56/58	60/70/72	1Meg
64	640 X 480	64K	Graphics	-	25/31.5	31.5/37.9	60/72	1Meg
66	640 X 480	32K	Graphics	-	25/31.5	31.5/37.9	60/72	1 Meg
6F	320 X 200	64K	Graphics	8 X 8	12.5	31.5	70	256K

2.6 Video Connector Pin Definitions

The PCM VGA terminates in a standard 15-Pin D-Shell connector suitable for connection to an ANALOG VGA or ANALOG Multi-Sync monitor capable of displaying the desired video mode(s). In no case will WinSystems or Cirrus Logic be liable for damage to monitors due to incorrect connection or usage. The pin definitions for the Video connector J2 are show below.

Pin	Signal	Monochrome	Color
1	Red	No Pin	Red
2	Green	Mono Dots	Green
3	Blue	No Pin	Blue
4	Reserved	No Pin	No Pin
5	Digital Gnd	Self Test	Self Test
6	Red Return	Key Pin	Red Return
7	Green Return	Mono Return	Green Return
8	Blue Return	No Pin	Blue Return
9	Plug	No Pin	No Pin
10	Digital Gnd	Digital Gnd	Digital Gnd
11	Reserved	No Pin	Digital Gnd
12	Reserved	Digital Gnd	No Pin
13	Horizontal Sync	Horizontal Sync	Horizontal Sync
14	Vertical Sync	Vertical Sync	Vertical Sync
15	Reserved	No Pin	No Pin

2.7 VESA Feature Connector Pin Definitions

J1 provides a VESA-compliant VGA pass through connector for transferring pixel data to or from the internal video DAC. The 13 pin 2 row connector is a less costly alternative than the IBM version, which requires a plated finger card-edge connector. The pin definitions for the J1 feature connector are shown below:

J1	
GND	1 ○ ○ 2 P0
GND	3 ○ ○ 4 P1
GND	5 ○ ○ 6 P2
EVIDEO	7 ○ ○ 8 P3
ESYNC	9 ○ ○ 10 P4
EDCLK	11 ○ ○ 12 P5
N/C	13 ○ ○ 14 P6
GND	15 ○ ○ 16 P7
GND	17 ○ ○ 18 DCLK
GND	19 ○ ○ 20 BLANK
GND	21 ○ ○ 22 HSYNC
N/C	23 ○ ○ 24 VSYNC
N/C	25 ○ ○ 26 GND

2.8 PC/104 Pin Definitions

The PCM-VGA adheres to the PC/104 standard for mechanical and electrical connection. The PC/104 bus is basically a redefinition of the popular ISA PC bus standard. Like the ISA bus, PC/104 encompasses 1 or 2 connectors depending on whether 16-bit support, 24-bit address support, or additional interrupt lines are required. The pin definitions for the primary and auxiliary PC/104 connectors J6 and J7 respectively are shown below :

J7		J6	
GND	D0 ○ ○ C0	IOCHK	A1 ○ ○ B1
MEMCS16	D1 ○ ○ C1	SD7	A2 ○ ○ B2
IOCS16	D2 ○ ○ C2	SD6	A3 ○ ○ B3
IRQ10	D3 ○ ○ C3	SD5	A4 ○ ○ B4
IRQ11	D4 ○ ○ C4	SD4	A5 ○ ○ B5
IRQ12	D5 ○ ○ C5	SD3	A6 ○ ○ B6
IRQ15	D6 ○ ○ C6	SD2	A7 ○ ○ B7
IRQ14	D7 ○ ○ C7	SD1	A8 ○ ○ B8
DACK0	D8 ○ ○ C8	SD0	A9 ○ ○ B9
DRQ0	D9 ○ ○ C9	IOCHRDY	A10 ○ ○ B10
DACK5	D10 ○ ○ C10	AEN	A11 ○ ○ B11
DRQ5	D11 ○ ○ C11	SA19	A12 ○ ○ B12
DACK6	D12 ○ ○ C12	SA18	A13 ○ ○ B13
DRQ6	D13 ○ ○ C13	SA17	A14 ○ ○ B14
DACK7	D14 ○ ○ C14	SA16	A15 ○ ○ B15
DRQ7	D15 ○ ○ C15	SA15	A16 ○ ○ B16
+5V	D16 ○ ○ C16	SA14	A17 ○ ○ B17
MASTER	D17 ○ ○ C17	SA13	A18 ○ ○ B18
GND	D18 ○ ○ C18	SA12	A19 ○ ○ B19
GND	D19 ○ ○ C19	SA11	A20 ○ ○ B20
		SA10	A21 ○ ○ B21
		SA9	A22 ○ ○ B22
		SA8	A23 ○ ○ B23
		SA7	A24 ○ ○ B24
		SA6	A25 ○ ○ B25
		SA5	A26 ○ ○ B26
		SA4	A27 ○ ○ B27
		SA3	A28 ○ ○ B28
		SA2	A29 ○ ○ B29
		SA1	A30 ○ ○ B30
		SA0	A31 ○ ○ B31
		GND	A32 ○ ○ B32
			GND
			RESET
			+5V
			IRQ2
			-5V
			DRQ2
			-12V
			OWS
			+12V
			GND
			SMEMW
			SMEMR
			IOW
			IOR
			DACK3
			DRQ3
			DACK1
			DRQ1
			DACK0
			CLK
			IRQ7
			IRQ6
			IRQ5
			IRQ4
			IRQ3
			DACK2
			T/C
			BALE
			+5V
			OSC
			GND
			GND

3 APPENDIX A

PCM-VGA MONITOR COMPATIBILITY CHART

Monitor Type	Examples	Horizontal Frequency (kHz)	Vertical Frequency (Hz)	Display Resolutions
0	IBM 8512 8513 8503	31.5	60 or 70	640 X 480
1	IBM 8514 8515	31.5 35.5	60 or 70 43.5 interlaced	640 X 480 1024 X 768
2	NEC 2A	31.5 35.2	60 or 70 56	640 X 480 800 X 600
3	NEC II	31.5 35.2 37.8	60 or 70 56 43.5 interlaced	640 X 480 800 X 600 1024 X 768
4	NEC 3D	31.5 37.8 37.8	60 or 70 60 43.5 interlaced	640 X 480 800 X 600 1024 X 768
5	Sony CPD-1304 NEC 3FGx Nanao 9065S, 9070U	31.5 48.0 48.0 48.0	60 or 70 72 60 43.5 interlaced	640 X 480 800 X 600 1024 X 768 1280 X 1024
6	NEC 4D 4FG Nanao T240i	31.5 48.0 56.0 48.0	60 or 70 72 72 43.5 interlaced	640 X 480 800 X 600 1024 X 768 1280 X 1024
7	NEC 5D 5FG, 6FG Nanao T550i, T560i, T660i, F550i, F570i	31.5 48.0 58.3 48.0	60 or 70 72 72 43.5 interlaced	640 X 480 800 X 600 1024 X 768 1280 X 1024



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2. Reason for the return.
3. Invoice number and date of purchase (if available), and original purchase order number.
4. Name, address, telephone and FAX number of the person making the request.
5. Do not debit WinSystems for the repair. WinSystems does not authorize debits.

After the RMA number is issued, please return the products promptly. Make sure the RMA number is visible on the outside of the shipping package.

The customer must send the product freight prepaid and insured. The product must be enclosed in an anti-static bag to protect it from damage caused by static electricity. Each bag must be completely sealed. Packing material must separate each unit returned and placed as a cushion between the unit(s) and the sides and top of the shipping container. WinSystems is not responsible for any damage to the product due to inadequate packaging or static electricity.