

FEATURES

- High-resolution, video controller supports:
 - Color STN, TFT and Dual-Scan Color STN panels with 8, 9, 12, 15, 16, 18, and 24-bit interfaces
 - Super VGA CRT video monitors
- Supports simultaneous CRT and LCD operation
- Hardware and BIOS compatible with VGA standards
- Integrated programmable linear address feature accelerates GUI performance
- Supports Panel resolutions including 800 x 600, 1024 x 768, and up to 1280 x 1024
- SMARTMAP™ intelligent color to gray scale conversion enhances text legibility
- Text enhancement feature improves white text contrast on flat panel displays
- Supports non-interlaced CRT monitors with resolutions up to 1024 x 768 x 256 colors
- Available with 512KB or 1MB of video RAM
- Onboard EPROM with BIOS extension
- Panel auto-initialization and power sequencing
- Optionally, multiple PCM-FPVGA-M boards can be installed in a system for multiple video support
- Optional flat panel adapter kits are available that include power inverters, BIOS modifications and cables for specific panels
- 16-bit PC/104 interface with stackthrough bus connectors

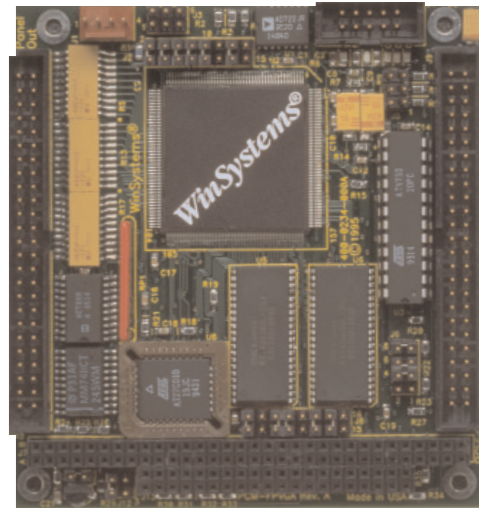
The PCM-FPVGA is a most versatile PC/104 expandable, high-performance VGA controller for a variety of flat panel LCD and CRT displays. This module can display the same data on both a flat panel and on a VGA CRT simultaneously.

The PCM-FPVGA is available with a number of options for greater system flexibility including multiple board support by a single CPU.

FUNCTIONAL CAPABILITY

PC/104 Interface - The PCM-FPVGA is available with a 16-bit PC/104 interface for maximum system performance. The PCM-FPVGA is both I/O and memory mapped in accordance with PC-AT video standards.

Multiple Boards - Up to 15 PCM-FPVGA boards can be installed in a stack for multi-video support. An optional I/O register allows the module to page in and out of the memory space under program control. Contact the factory for part number, pricing, and a software driver.

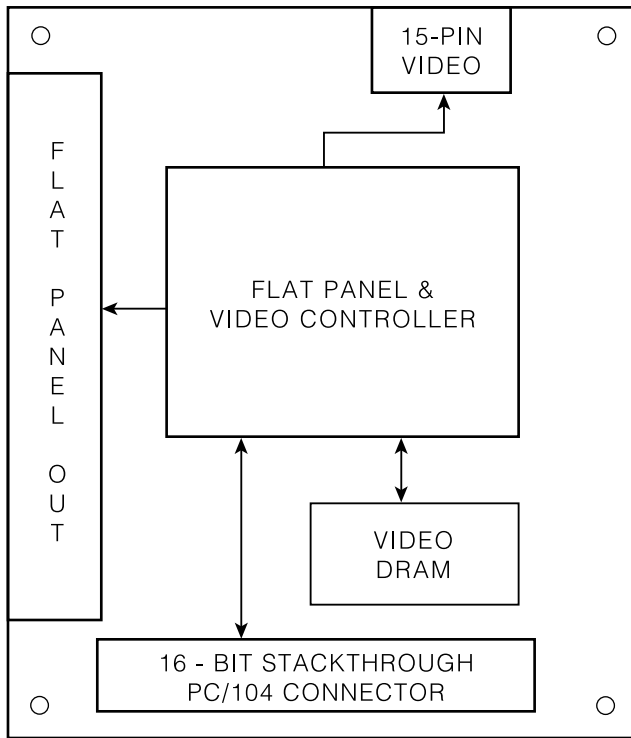


Video Controller - A Chips and Technologies' 65545 flat panel/CRT controller populates the SAT-SXPlus. This high-performance 65545 provides the graphics hardware engine required to perform Bit Block Transfer (BIT-BLT), line drawing, hardware cursor control and other functions intensively use in Graphical User Interfaces.

The controller integrates the VGA-compatible graphics controller, true color RAMDAC, and PLL clock synthesizers. A single 256K x 16 DRAM supports most standard video display modes.

The video controller offers a variety of programmable features to optimize display quality. For text modes which do not fill all 480 lines of a standard VGA panel, the 65545 provides tall font stretching in the hardware. Fast vertical centering and programmable vertical stretching in graphics modes offer more options for handling modes with less than 480 lines. Three selectable color-to-gray scale reduction techniques plus SMARTMAP™ are available for improving the viewability of color applications on monochrome panels.

The 65545 is fully compatible with the VGA graphics standard at the register, gate, and BIOS level. It provides backward compatibility with the EGA and CGA graphics standards without using NMIs.



PCM-FPVGA BLOCK DIAGRAM

Video Memory - An onboard 256KB x 16 DRAM provides 512KB of video memory. This is sufficient for most applications. The amount of memory is a function of the desired screen resolution and maximum number of colors displayed. For maximum performance, the PCM-FPVGA can be ordered with an additional 256K x 16 DRAM offering resolutions up to 1024

x 768 with 256 colors, 800 x 600 with 256 colors, and 640 x 480 with 16M colors. The table below details the video modes and required amount of RAM for the PCM-FPVGA board.

A BIOS extension in the onboard EPROM provides PC video compatibility for the various modes of operation for the different panels.

CRT Video Interface - The PCM-FPVGA supports high resolution fixed frequency and variable frequency analog monitors in interlaced and non-interlace modes of operation. Digital monitor support is also built in. The CRT video output signals are wired to a 10-pin dual-in-line connector at the edge of the board. A CBL-207-1 interface cable adapts it to a standard female 15-pin "D-Sub" type connector commonly used for VGA. Simultaneous operation of the CRT and LCD is supported.

Flat Panel Display Support - The PCM-FPVGA supports all flat panel display technologies including plasma, electroluminescent (EL), and liquid crystal (LCD). The 65545 provides register programmable features to allow interfacing to the widest possible range of flat panel displays. LCD panel interfaces are provided for single panel-single drive (SS) and dual panel-dual drive (DD) configurations. A single panel sequences data similar to a CRT (i.e. sequentially from one area of video memory). In contrast, a dual panel requires video data to be provided alternating from two separate areas of video memory. In addition, a dual drive panel requires the data from the two areas to be provided to the panel simultaneously. Due to its integrated frame buffer and

CRT Mode Resolution	Color ⁴	Mono LCD Gray Scales ⁴	DD STN LCD Colors ^{2,3,4}	9-Bit TFT LCD Colors ^{1,2,3,4}	Video Memory	Simultaneous Display
320x200	256/256K†	61/61	256/226,981	256/185,193	512KB	Yes
640x480	16/256K†	16/61	16/226,981	16/185,193	512KB	Yes
640x480	256/256K†	61/61	256/226,981	256/185,193	512KB	Yes
800x600	16/256K†	16/61	16/226,981	16/185,193	512KB	Yes with 1MB
800x600	256/256K†	61/61	256/226,981	256/185,193	512KB	Yes with 1MB
1024x768	16/256K†	16/61	16/226,981	16/185,193	512KB	Yes with 1MB

Notes:

1. Larger color palettes and simultaneous color can be display on 12-bit, 8-bit and 24-bit TFT panels via the 65545 video input port.
 2. Includes dithering.
 3. Includes frame rate control.
 4. Colors are described as number of simultaneous on-screen colors and number of unique colors available in the color palette.
- † 256K colors assumes DAC output mode is set to 6 bits of R, G, and B. If DAC is set to 8-bit output mode, the number of available colors is 16M.

24-data-line panel interface, the PCM-FPVGA supports all panels directly. The PCM-FPVGA handles display data sequencing transparently to applications software, providing full compatibility on both CRT and flat panel displays.

FP-50 Interface - Because there isn't a standard electrical or mechanical interface for flat panel displays, WinSystems developed a flat panel interface system configuration to work with the different interface signals, timing requirements and connectors that vary between panel technologies and suppliers. This solution consists of a standard 50-pin panel interface called the FP-50, a panel personality module, and associated cables.

The FP-50 video bus supports panels that require from 8 to 24-bits per pixel. It also has power, timing and control signals for various panel types. Finally, up to 4 lines are assigned to allow the PCM-FPVGA to read an ID jumper setting on the personality module so as to auto configure the BIOS for the correct panel type.

FPA - WinSystems has defined a personality module called the Flat Panel Adapter (FPA). Each panel requires a different adapter because of signal pin definition, power sequencing of backlight and panel power, contrast controls and cable connections. The FPA tailors the PCM-FPVGA controller to a specific panel.

A FPA module is the same physical size as a PC/104 module, 3.6" x 3.8" (90mm x 96mm) and has the same mounting holes. The module can be placed on the stack if desired, but does not require any signals from the bus. Alternatively, it can be mounted near the panel to keep the cable lengths short.

General features of the FPA include trim pots onboard to provide backlight brightness for the active matrix color

TFT panels. Also a contrast control is installed for use with the passive color panel. Switching transistors sequence power to the panels.

Special attention is given to mechanical and mounting issues. Panels and cable connections are very fragile and not designed for repeated insertions. Also, the backlight power supply (if required) is a separate module.

FPA-6435 - This adapter is designed for the Sharp LM64C35P, 640 x 480 color passive matrix TSTN. It includes the power switching circuitry and brightness and contrast trim pots which can be remotely mounted.

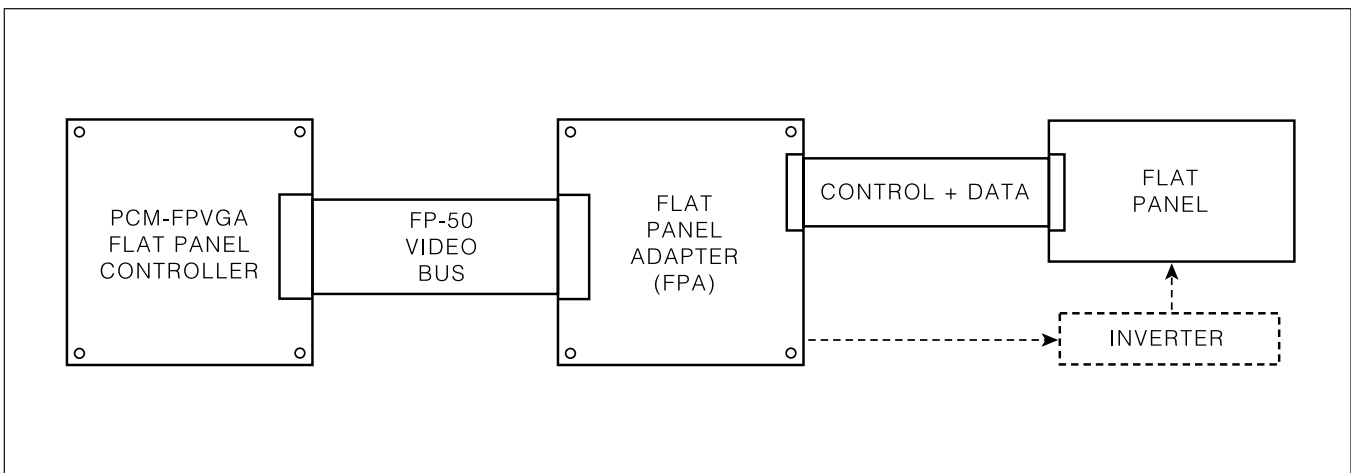
FPA-10344 - This adapter is designed for the Sharp LM64C35P, 640 x 480 x 262,144 color active matrix TFT. It contains a brightness trim pot that can be remotely mounted for easier access by the user.

FPA-9161 - This adapter is designed for the Sharp LQ9D161 and LQ9D031 color active matrix TFT. It also contains a brightness trim pot that can be remotely mounted.

WinSystems continues to develop Flat Panel Adapters to provide connections to many flat panel displays. For a list on current panels supported or to request a FPA for your specific panel, contact your WinSystems' application engineer or visit WinSystems' web site <http://www.winsystems.com>.

Panel Adapter Kits - WinSystems offers the cables, panel adapter module and power inverters for the backlight to make initial development easier and quicker for users of the PCM-FPVGA board. The panel is not included with the kit.

Panel Mounting - WinSystems offers single board computers integrated with flat panels and touch screens for



OEMs. Contact our factory for data sheets, pricing and delivery for the display systems.

Panel Power Sequencing - Flat panel displays are extremely sensitive to conditions where full biasing voltage is applied to the liquid crystal material before the control and data signals to the panel are stable. The PCM-FPVGA properly sequences the driver electronics logic voltage and the backlight voltage to provide intelligent power sequencing to the panel.

Software - Software drivers are available with high-resolution drivers for various software packages for Windows, OS/2 and DOS applications. Video BIOS modifications can be made for custom panel types.

SPECIFICATIONS

Electrical

PC/104 Interface: 16-bit stackthrough

Power: +5V $\pm 5\%$ @ 300 mA typ. (with no panel)
 $\pm 12V$ may be required by the FPA board for a specific panel type. It is not required by the PCM-FPVGA module.

Mechanical

Dimensions: 3.6" x 3.8" (90mm x 96mm)

Connectors

CRT: 10-pin dual on 0.100" grid

Panel: 50-pin dual on 0.100" grid

Jumpers: 0.025" square posts

Environmental

Operating Temperature: -40° to +85° Celsius

ORDERING INFORMATION

PCM-FPVGA-16-1M 16-bit SuperVGA and flat panel controller with 1MB video RAM

PCM-FPVGA-16-512 16-bit SuperVGA and flat panel controller with 512KB video RAM

CBL-207-1 15-pin D VGA video adapter cable

Contact the factory for the current price, delivery, and status of the PCM-FPVGA panel interface kits.

