Modular Computers ®

CP330

Universal Flatpanel
XGA Graphics Controller

Manual ID 20148, Rev. Index 0300
Apr 99

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Preface

Revision History

Revision History			
Manual/Product Title:	**CP330**		
Manual ID Number:	**20148**		
Rev. Index	**Brief Description of Changes**	**Board Index**	**Date of Issue**
0100	Initial Issue		Nov. 97
0200	Standard Preface + System Description		Apr. 98
0201	Sections 1.1- 1.2, 1.10 - 1.11		Aug. 98
0300	Major revision of manual	I2020	Apr. 99

Trademarks

Explanation of Symbols

CE Conformity

This symbol indicates that the item described in this manual is in compliance with all applied CE standards. See also the section "Applied standards" of this manual.

Caution!

This symbol and title warn you of hazards due to electrical shocks (> 60 V) when touching products or parts of them. The non-observance of the measures indicated and/or prescribed by the law may cause harm to your product and/or life/health.

See also the section "High Voltage Safety Instructions".

ESD-Sensitive Device!

This symbol and title inform you that electronic boards and their components are sensitive to static electricity. Therefore, care must be taken during all handling operations and inspections of this product, in order to ensure product integrity at all times.

Please read also the section "Special Handling and Unpacking Instructions" of this manual.

Attention!

This symbol and title emphasize aspects which, if not read through carefully by the reader, might cause hazards to health and/or damages to material.

Note:

This symbol and title emphasize aspects the reader should read through carefully for his or her own advantage.

PEP Advantage

This symbol and title emphasize advantages or positive aspects of a product and/or procedure.

Troubleshooting

This symbol and title characterize a message containing useful information on troubleshooting and problem solving.

For your safety

Your new *PEP* product was developed and tested carefully to provide all features necessary to ensure the renown electrical safety requirements. It was also designed for a long fault-free life. However, the life expectancy of your product can be drastically reduced by improper treatment during unpacking and installation. Therefore, in the interests of your own safety and of the correct operation of your new *PEP* product, you are requested to conform with the following guidelines.

High Voltage Safety Instructions

Warning!

All operations on this device must be carried out by sufficiently skilled personnel only.

Caution!

However, serious electrical shock hazards exist during all installation, repair and maintenance operations with this product. Therefore, always unplug the power cable to avoid exposure to hazardous voltage.
Before installing your new *PEP* product into a system always ensure that your mains power is switched off. This applies also to the installation of piggybacks.

Special Handling and Unpacking Instructions

ESD Sensitive Device!

Electronic boards and their components are sensitive to static electricity. Therefore, care must be taken during all handling operations and inspections of this product, in order to ensure product integrity at all times.

☞ Do not handle this product out of its protective enclosure while it is not used for operational purposes, unless it is otherwise protected.

☞ Whenever possible, unpack or pack this product only at EOS/ESD safe work stations. Where safe work stations are not guaranteed, it is important for the user to be electrically discharged before touching the product with his/her hands or tools. This is most easily done by touching a metal part of your system housing.

☞ It is particularly important to observe standard anti-static precautions when changing piggybacks, ROM devices, jumper settings etc. If the product contains batteries for RTC or memory back-up, ensure that the board is not placed on conductive surfaces, including anti-static plastics or sponges. They can cause short circuits and damage the batteries or tracks on the board.

General Instructions on Usage

  ❧ In order to maintain *PEP's* product warranty, this product must not be altered or modified in any way. Changes or modifications to the device, which are not explicitly approved by *PEP Modular Computers* and described in this manual or received from *PEP* Technical Support as a special handling instruction, will void your warranty.

  ❧ This device should only be installed in or connected to systems that fulfill all necessary technical and specific environmental requirements. This applies also to the operational temperature range of the specific board version, which must not be exceeded. If batteries are present, their temperature restrictions must be taken into account.

  ❧ In performing all necessary installation and application operations, please, follow only the instructions supplied by the present manual.

  ❧ Keep all the original packaging material for future storage or warranty shipments. If it is necessary to store or ship the board please re-pack it as nearly as possible in the manner in which it was delivered.

  ❧ Special care is necessary when handling or unpacking the product. Please, consult the special handling and unpacking instruction on the previous page of this manual.

Two Years Warranty

PEP Modular Computers grants the original purchaser of *PEP* products a **TWO YEARS LIMITED HARDWARE WARRANTY** as described in the following. However, no other warranties that may be granted or implied by anyone on behalf of *PEP* are valid unless the consumer has the express written consent of *PEP Modular Computers*.

PEP Modular Computers warrants their own products, excluding software, to be free from manufacturing and material defects for a period of 24 consecutive months from the date of purchase. This warranty is not transferable nor extendible to cover any other users or long-term storage of the product. It does not cover products which have been modified, altered or repaired by any other party than *PEP Modular Computers* or their authorized agents. Furthermore, any product which has been, or is suspected of being damaged as a result of negligence, improper use, incorrect handling, servicing or maintenance, or which has been damaged as a result of excessive current/voltage or temperature, or which has had its serial number(s), any other markings or parts thereof altered, defaced or removed will also be excluded from this warranty.

If the customer's eligibility for warranty has not been voided, in the event of any claim, he may return the product at the earliest possible convenience to the original place of purchase, together with a copy of the original document of purchase, a full description of the application the product is used on and a description of the defect. Pack the product in such a way as to ensure safe transportation (see our safety instructions).

PEP provides for repair or replacement of any part, assembly or sub-assembly at their own discretion, or to refund the original cost of purchase, if appropriate. In the event of repair, refunding or replacement of any part, the ownership of the removed or replaced parts reverts to *PEP Modular Computers*, and the remaining part of the original guarantee, or any new guarantee to cover the repaired or replaced items, will be transferred to cover the new or repaired items. Any extensions to the original guarantee are considered gestures of goodwill, and will be defined in the "Repair Report" issued by *PEP* with the repaired or replaced item.

PEP Modular Computers will not accept liability for any further claims resulting directly or indirectly from any warranty claim, other than the above specified repair, replacement or refunding. In particular, all claims for damage to any system or process in which the product was employed, or any loss incurred as a result of the product not functioning at any given time, are excluded. The extent of *PEP Modular Computers* liability to the customer shall not exceed the original purchase price of the item for which the claim exists.

PEP Modular Computers issues no warranty or representation, either explicit or implicit, with respect to its products' reliability, fitness, quality, marketability or ability to fulfil any particular application or purpose. As a result, the products are sold "as is," and the responsibility to ensure their suitability for any given task remains that of the purchaser. In no event will *PEP* be liable for direct, indirect or consequential damages resulting from the use of our hardware or software products, or documentation, even if PEP were advised of the possibility of such claims prior to the purchase of the product or during any period since the date of its purchase.

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Chapter **1**

Introduction

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1. Introduction

1.1 System Overview

The *PEP Modular Computers* CompactPCI systems described in this chapter operate with the PCI bus architecture to support additional I/O and memory-mapped devices as required by various industrial applications. In the following you will find the most important information on all system relevant CompactPCI features. For more detailed information concerning the CompactPCI standard, please consult the complete Peripheral Component Interconnect (PCI) and CompactPCI Specifications. For further information regarding these standards and their use, visit the homepage of the *PCI Industrial Computer Manufacturers Group (PICMG)*.

1.1.1   Note on CompactPCI

CompactPCI is an extension of the PCI specification. It has been optimized for industrial and embedded applications that require a more robust mechanical form factor as compared to Desktop PCI. CompactPCI systems use industry standard mechanical components and high performance connector technologies to provide systems that are well suited for rugged applications. CompactPCI stands for systems that are electrically compatible with the PCI Specification, allowing low cost PCI components to be used. CompactPCI is an open specification supported by PICMG.

1.1.2   Main Features of CompactPCI Systems

Some of the outstanding features of the CompactPCI systems compliant with Specification 2.0, Release 2.1 are:

- PCI signalling
- 32 and 64 bit data transfer at 33 MHz
- up to 16 PCI slots per backplane
- industry standard software support
- 3U small form factor (100 mm by 160 mm)
- 6U form factor (233 mm by 160 mm)
- Eurocard packaging
- wide variety of available I/O functions
- industry support from over 350 members.
- possibility of PMC modules on some boards

PEP Advantage

PEP Modular Computers' CompactPCI systems are designed as open systems, able to be expanded at any time, so that their backplanes can be equipped with precisely the CPCI boards that correspond to a customer's specific needs. However, in order to supply you with an appropriate choice of workstations, the *PEP* basic equipment is divided into pre-configured sets and custom solutions.

1.2 System Components

PEP Modular Computers have devised their CompactPCI systems as a comprehensive open solution for industrial environments, offering different workstation configurations which are capable of including all the components necessary to fulfill the requirements of virtually all existing system functionalities.

CompactPCI Backplane(s)

- 4-slot backplane;
- 6-slot backplane;
- 8-slot backplane;
- 16-slot backplane.

CPU Function

PEP Modular Computers provides CPU boards corresponding in size and characteristics to the special features of the *PEP* systems.

Display Related Functions

Display related functions such as frame grabbing are supported by dedicated boards.

Communication

Communication boards are provided for the currently relevant industrial communication systems such as Fast Ethernet.

Fieldbus Control

Fieldbus control boards provide data exchange with field control and automation subsystems like *PEP Modular Computers'* SMART2 or VMEbus systems using up-to-date transmission standards for example:

- CAN fieldbus control
- PROFIBUS control

Industrial I/O Functions

PEP's CompactPCI systems support an ever increasing number of industrial I/O functionalities in the fields of:

- Digital I/O
- Analog I/O

Self-Testing

A special *PEP* self-testing board provides a trouble-spotting capability within your *PEP* system.

System Hardware

The *PEP* CompactPCI system hardware includes housings, storage devices, power supply units, network adapters etc. The most important system hardware elements with which to configure your CompactPCI system are as follows:

Multiprocessor

In a CompactPCI multiprocessor system, a system controller communicates with other CPU's through a non-transparent PCI / PCI bridge. *PEP Modular Computers'* Compact-PCI system controllers, CP600/CP610, which are designed to work together with PEP CPU's, CP611/CP612, provide full multiprocessor solutions.

Housings

- Board cages for 19-inch cabinets or wall mounting
- PCI tower
- PCI desktop housing

Mass Storage Devices

- Hard-disk drive
- Floppy-disk drive
- CD-ROM drive

Power Supply Units

- 6U "M", 270 W, 120/230 V AC, 3.3V/30A, 5.1V/20A, 12V/4A, -12V/2A
- 3U "M", 180 W, 120/230 V AC, 3.3V/14A, 5.1V/20A, 12V/2A, -12V/1A
- "ATX", 235 W, 120/230 VAC, 3.3V/14A, 5V/22A, 12V/8A,-12V/1A, -5V/0.5A, 5VSB/0.1A

Form Factors

PEP Modular Computers CompactPCI boards are available in different form factors, mainly as 3U (single-height) and 6U (double-height) boards and as 4HP (single-width), 8HP (double-width), and 12HP (triple-width) boards.

Please note that the following units of measurement are used to express the dimensions of *PEP* CompactPCI card slots:

- Height: 1 U = 44.45 mm
- Width: 1 HP = 5.08 mm

On certain boards/carriers with PMC connectors, PMC add-on modules can also be installed. Please note that the form factor currently implemented by *PEP Modular Computers* for its PMC modules is:

- 149mm x 74mm (single-size standard).

For a detailed description of the *PEP Modular Computers* CompactPCI modules please consult the specific component's manuals or data sheets.
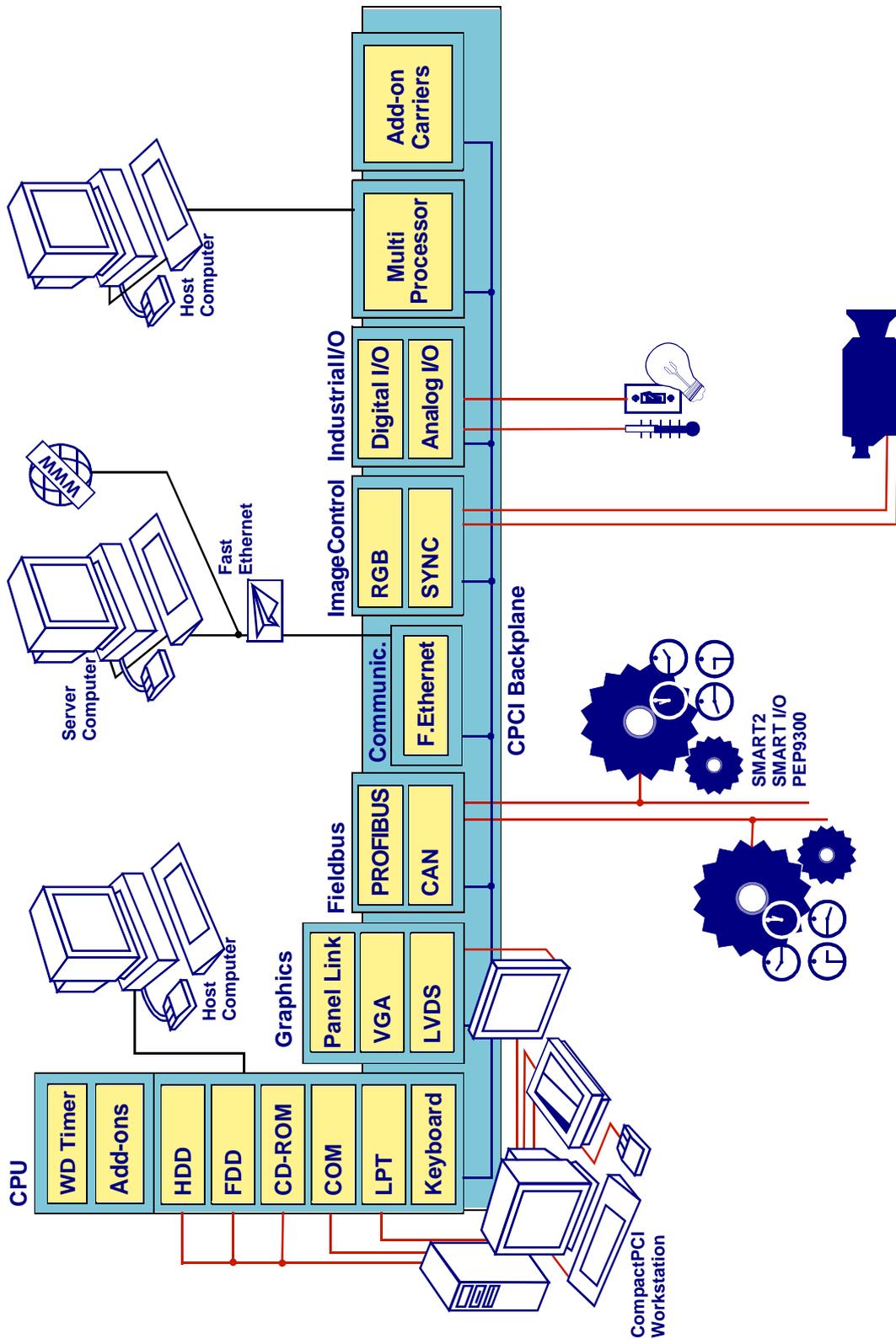
PEP Advantage

As the *PEP Modular Computers* CompactPCI system provides comprehensive open solutions, new features and functionalities may be added to our range. To keep abreast of the latest developments, please contact your local *PEP Sales Office* or visit the *PEP Web Site*.

Figure 1-1: Example of a *PEP Modular Computers* CompactPCI System

1.3 Board Introduction

Based around the Chips&Technologies (C&T) 65550 multi-media graphics chip, the CP330 is a CompactPCI flat-panel XGA graphics board built for use with all standard displays. The CP330 is equipped with an optional video signal input and integrated LVDS interface. The LVDS provides the user with the possibility of connecting all types of flat-panel display with up to 24-bit resolution (16.7 million colors.) Together with the VPX digital television chip, the CP330 allows video signals to be merged and scaled directly in video RAM ready for real-time display.

Embedded within the LVDS cable are the +5V DC, +12V DC and control lines required for remote display connection together with additional lines provided for touch-panel displays or a keyboard.

Electromagnetic radiation emission levels are within the confines of the DIN EN 55022B and EN 50082-1 standards.

- If a flat-panel is not listed in this manual, please refer to the technical manual for the C&T 65550 graphic chip or consult the *PEP* support engineers. A specific BIOS for almost any panel on the market can be created at relatively short notice by *PEP Modular Computers GmbH* or by our authorised partners. Simultaneous display on flat-panel (EL monochrome, 24-bit TFT, 24-bit plasma or dual-scan STN color) and CRT-monitors (up to 16 different panels are switch selectable) is possible.
- Up to 16.7 million colors for VGA, SVGA and XGA resolution
- Optional NTSC/PAL composite or S-Video input with video buffer overlay
- Repetition rates up to 240 cycles, depending on panel type (e.g. SGD EL320.240.36)
- Up to 10m connection of external flat-panels via the LVDS-interface
- Low EMI emission
- 2 Mbyte video memory
- High performance embedded XRAM video cache
- Hardware Windows accelerator with 32-bit graphics engine
- Various power-down and sleep modes
- Display-centering / stretching for larger displays
- BIOS supported on socket
- Microsoft Windows 95 and WindowsNT compatible
- Compatible with CompactPCI specification V2.1

1.4 Functional Block Diagram

Figure 1-2: CP330 Functional Block Diagram
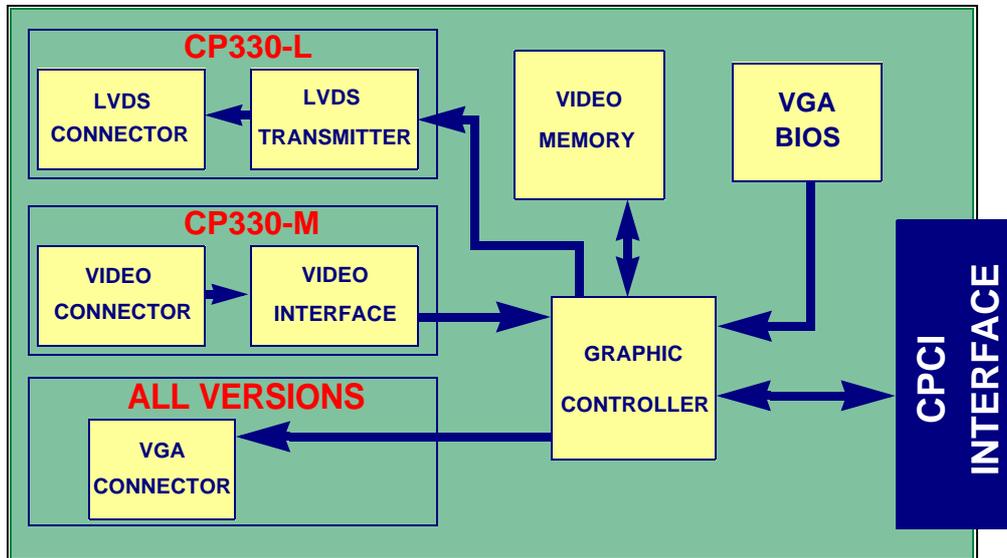
1.5 Main Features

The standard version of the CP330 is equipped with 2 Mbytes DRAM, a 15-pin D-Sub VGA connector for 640x480 pixel color CRTs and is prepared for 3.3V controllers.

1.5.1 Video Memory

The 2 MByte video memory is shared by the VGA logic and multi-media options from the capture port.

The organisation of the memory and video modes are defined by the BIOS and details are listed in the respective table for the panel type used.

When calculating the memory requirement, one has to understand that the graphic chip uses approx. 300 kByte for it's internal organisation. Live-video occupies 2 x 150 kBytes for double buffering the external video.

1.5.2 Video Resolution

Table 1-1: Video Resolution Particulars

Resolution	Color Depth		Required Memory	Comments
	Bits	Colors		
640x480	24	16 million	921 kBytes	True-Color
800x600	24	16 million	1440 kBytes	True-Color
1024x768	16	64 thousand	1572 kBytes	High-Color
1280x1024	8	256	1310 kBytes	N/A

1.5.3 Display List

Table 1-2: List of Approved Displays

Display	Comments			BIOS version	Adapter
EL640.480-AF1, -AG1, -AM1	Connect directly to EL-Connector			> v1.0	EL-connector (optional)
EL320.240.36	SGD, EL-Monochrome, 5.7"			> v1.0	N/A
Fujitsu FPF21C8060UA-92	640 x 480,	Plasma 21",	18-bit color	> v1.0	FUJITSU
Fujitsu FPF42C10660UB-01	852 x 480,	Plasma 42",	24-bit color	> v1.0	FUJITSU
Sharp LQ10D341, ...345	640 x 480,	TFT 10.4",	18-bit color	> v1.0	ADAPTER 2
Sharp LQ10D42	640 x 480,	TFT 10.4",	18-bit color	> v1.0	ADAPTER 2
Sharp LQ14X01	1024 x 768,	TFT 14",	12-bit color	> v1.0	ADAPTER 3
NEC NL6448AC33-18	640 x 480,	TFT 10.4",	18-bit color	> v1.0	ADAPTER 2
NEC NL6448AC20-06	640 x 480,	TFT 6.5",	18-bit color	> v1.0	ADAPTER 2
NEC NL10276AC24-01	1024 x 768,	TFT 12.4",	12-bit color	> v1.0	ADAPTER 4

Important!

The displays listed are only a subset of the possible adaptations. The list of available displays is steadily growing and other displays may be added on request. For OEM quantities, a BIOS-subset of 8 panels can be customized.

1.5.4 Front Panel

Figure 1-3: CP330 Front Panels

Board Variants:

1 **CP330-M**

2 **CP330-L**

3 **CP330-C and CP330-CR**
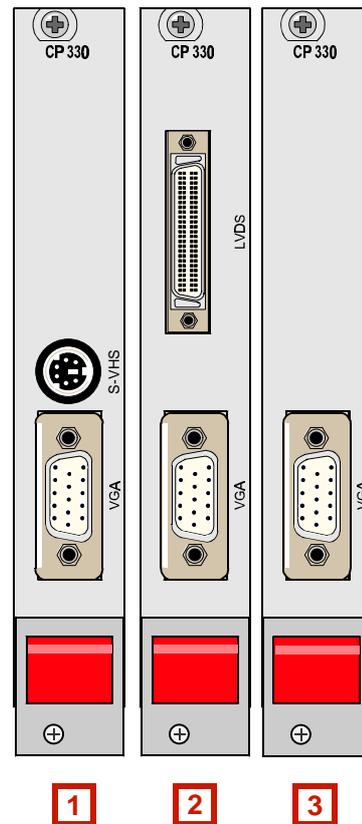
1.5.5 Board Interfaces

The various graphic display signals of the CP330 are routed to the physical interfaces on the front-panel or to the rear CompactPCI P2 connector.

The following connectors are available in the front-panel:

- One standard 15-pin VGA connector
- One mini-DIN connector for analog S-Video or composite video signals, **or**
- One LVDS connector (26-pin miniature Delta Ribbon) for flat-panel displays up to 16.7 million colors
- P2 connector

S-Video Connector

S-Video signals are routed through the front-panel via a mini DIN connector. As the CP330 variants use standard connectors, special adapter cables for cameras or SCART connectors should be purchased from video or photographic specialists

With the powerful C&T 65550 graphic chip, it is possible to mount an optional video pixel decoder (VPX) on the board to scale external TV signals directly into the video memory and display the video live on the screen, without loading the CompactPCI bus. Both composite and S-video inputs are possible and can be selected by software..

LVDS

An optional LVDS interface can be used to connect remote digital flatpanels at a distance of up to 10m from the interface.

Important!

Dual-scan flatpanels cannot use this interface due to inconsistent clock requirements.

A 26-pin cable carries all the required signals including the +5V and +12V supplies together with several control signals for use by external keyboards, touch screens or similar peripheral devices.

The far end of the cable connects to a translation module for display compatibility.

P2 Connectors

The connection of a dual-scan STN color display is only possible via the P2 Compact-PCI connector which is only available on the CP330-CR.

Important!

CompactPCI backplanes not supporting the P2 connector for rear I/O to breakout cannot take advantage of all the features provided by the CP330.

Please make sure that the CompactPCI backplane in use is capable of handling the high current requirements of certain displays.

Display Adapters

The CP330 permits the usage of two basic types of flat-panel display adapters: those connected directly to the front panel connectors, and those supported by the Compact-PCI Rear I/O specification.

The front-panel adapters (known as receivers) can either be embedded or external to the display itself. The Rear I/O adapters are essentially the same, except that some type of transition board is required to provide signal connection to the CompactPCI back-plane. This transition board may also provide transmitter functions, or the transmitter functions may be contained in a external adapter. The receiver functions are analog to the front-panel adapters.

These display adapters and transition boards are optional items and must be ordered separately. Please contact *PEP Modular Computers GmbH* for further information.

1.6 Board Layout

Figure 1-4: CP330-C/-CR Board Layout (Front View)
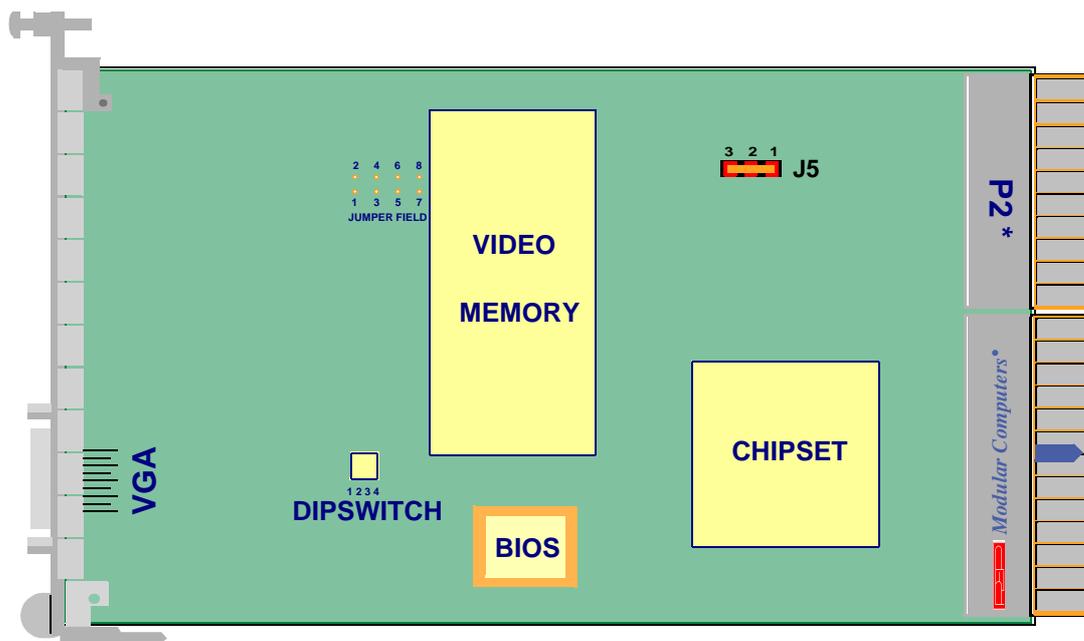
* only available on CP330-CR

Figure 1-5: CP330-L Board Layout (Front View)
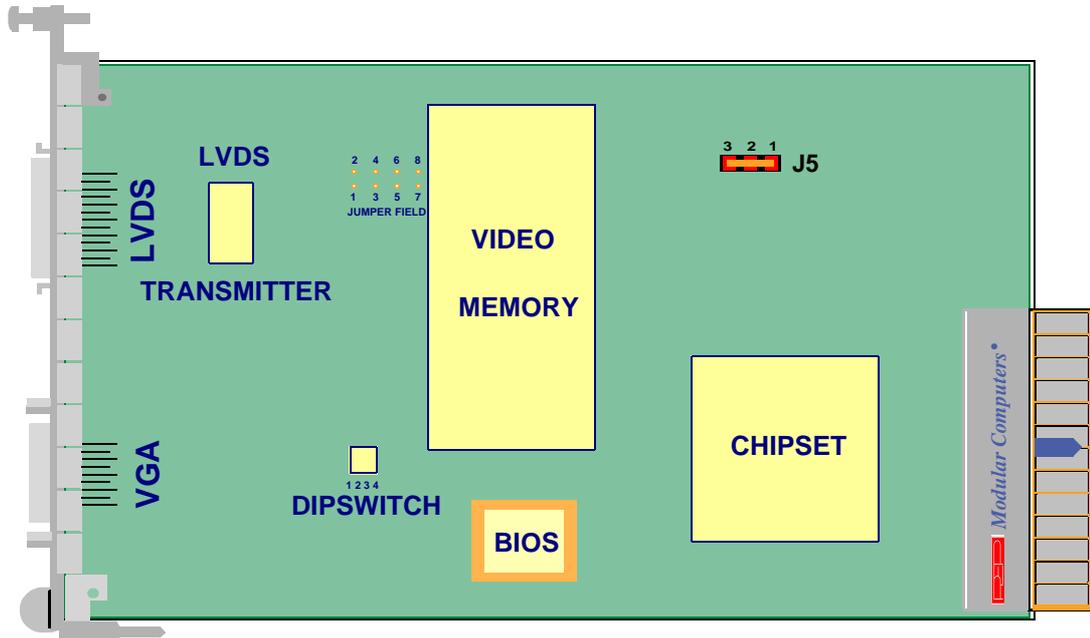
Figure 1-6: CP330-M Board Layout (Front View)
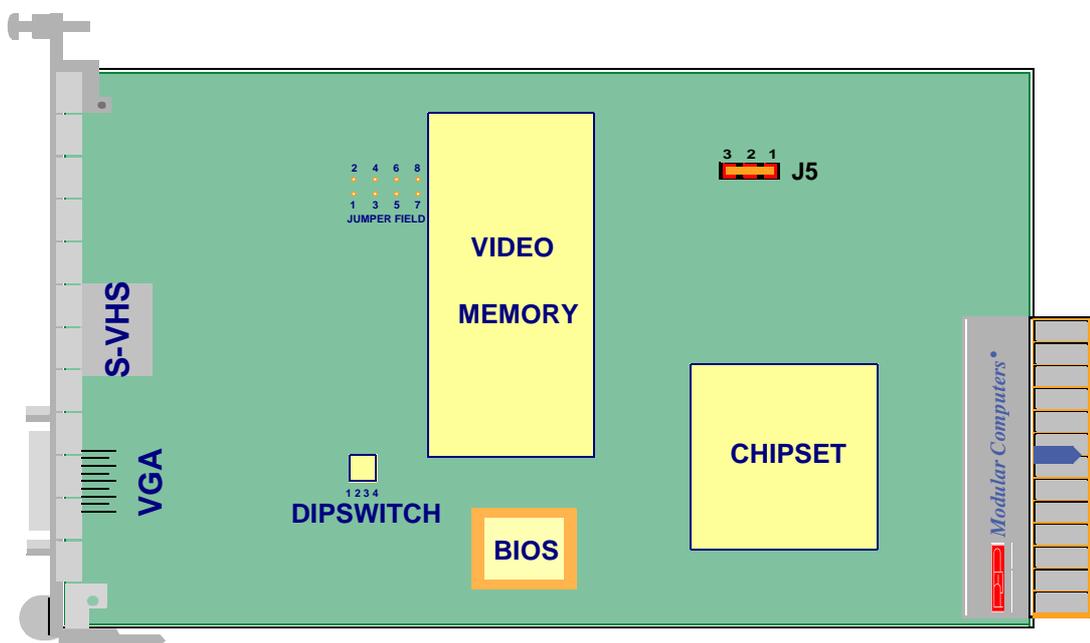
1.7 Technical Specifications

Table 1-3: CP330 Technical Specifications

CP330	Specification
CompactPCI Interface	PICMG 2.0 Rev. 2.1 compliant September 2, 1997, connected to P1 32 bit bus address/data / 33MHz CompactPCI data burst rate close to 132 Mbyte/s Universal signaling voltage (3.3V, to fit in 3.3V or 5V bus)

Supported VGA-Resolutions	With C&T65550: 1024 x 768 x 8 @ 60 Hz
	                              800 x 600 x 16 @ 60 Hz
	                              640 x 480 x 24 @ 60 Hz

Flat Panel Support	TFT, Dual-Scan STN, EL, Plasma
Flat Panel Interfaces	Internal TTL-Interface by P2 Connector (CP330-CR) External LVDS-Interface (CP330-L)
Video Signal Input	External S-VHS Interface (CP330-M)
Video Memory	2 MB Memory
Bios Memory	64kB for Video BIOS
On Board Connectors	Front • 1x 15 pin DSUB for front panel interface VGA • 1x 26 pin Mini D Ribbon (CP330-L) for front panel interface LVDS • 1x 4 pin Mini DIN (CP330-M) for front panel interface S-Video Rear • 1x P1 CPCI connector • 1x P2 CPCI connector (CP330-CR)
Driver-Support	Windows NT
Mechanical Conformance	Conforms to IEEE 1101.10
Power Consumption	Approx. 3.5W @ 5V DC without display
Temperature Range	Operating: 0°C ... +55°C Storage: -55°C ... +125°C
Humidity	0 ... 95% non condensing
Dimensions	160 mm x 100 mm single height Eurocard
Weight	110g

1.8 Applied Standards

1.8.1   CE Compliance

The *PEP Modular Computers'* CompactPCI systems comply with the requirements of the following CE-relevant standards:

- Emission   EN50081-1
- Immission   EN50082-2
- Electrical Safety   EN60950

1.8.2   Mechanical Compliance

- Mechanical Dimensions   IEEE 1101.10

1.8.3   Environmental Tests

- Vibration/Broad-Band   IEC68-2-6
  Random Vibration   IEC68-2-64 (3U boards)
- Permanent Shock   IEC68-2-29
- Single Shock   IEC68-2-27

1.9 Related Publications

1.9.1   CompactPCI Systems/Boards

CompactPCI Specification, V. 2.0, Rev. 2.1

1.9.2   Video Technology

- 65550 HiQVideo™Series Application Note, Rev 1.4
- 65550 NTSC/PAL Support, BIOS Functions, Rev 1.0
- 65550 Flatpanel/CRT GUI Accelerator Data sheet, Rev. 0.8

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Chapter 2

Installation

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2. Installation

2.1 Board Installation

Caution!

If your board type is not specifically qualified as hot-swap capable, please switch off the CompactPCI system before installing the board in a free CompactPCI slot. Failure to do so could endanger your life/health and may damage your board or system.

Note:

Certain CompactPCI boards require bus master and/or rear I/O capability. If you are in doubt whether such features are required for the board you intend to install, please check your specific board and/or system documentation to make sure your system is provided with an appropriate free slot to insert the board.

ESD Equipment!

Your CompactPCI board contains electrostatically sensitive devices. Please observe the necessary precautions to avoid damage to your board:

- Discharge your clothing before touching the assembly. Tools must be discharged before use.
- Do not touch components, connector-pins or traces.
- If working at an anti-static workbench with professional discharging equipment, please do not omit to use it.

The CP330 board can be installed in any CompactPCI-compatible computer with a free non bus-master slot. The front-panel should be safely secured by screws to the chassis to avoid loosening of the board through vibration and to ensure correct earth connection.

Supported Monitors

The board can drive regular CRT monitors using the 15-pin VGA connector on the front-panel. Through the use of the CompactPCI P2 connector or the front-panel connectors, flat-panel displays can be addressed. If an application demands that the flat-panel display be located at a distance in excess of 60 cm (24") from the CP330, the LVDS connector must be used. An LVDS receiver board (a translation module interfacing the LVDS signals with the display-specific interface) should be mounted within the panel housing and connected with a ribbon-cable not exceeding 30 cm (12") in length.

Cable Characteristics

The LVDS cable makes provision for the +5V DC and +12V DC power supply required by the displays and supplies a maximum current of 2.3A each. This high amperage is required for TFT displays supporting a backlight or if a keyboard or touch-panel is to be implemented.

2.2 Software Installation

2.2.1 Driver Installation

Drivers for Windows NT and other supported operating systems are provided with the CP330 driver kit. Exact guidelines may be found in the file "readme.txt". Please follow these instructions before installation. Please follow the interactive instructions of the installation program and enter specific data when prompted.

> *Note:*
>
> Please ensure that the connected monitor or display supports the selected resolution otherwise damage may result due to incorrect operating frequency parameters.

2.2.2 Video Insertion

To demonstrate the video input, the program "PC-Video" supplied by C&T should be used. Please note that this program uses a part of the video memory when called which may reduce the memory available for color depth.

Additionally, this program scales the TV video to 1/4 VGA (320 x 240 pixels). Even when the video-window is expanded, the resolution is not increased. To display video from this input with the correct resolution, a special program is required which is not included with this utility. Windows DLLs are, however, available for programmers to install their own software.

To setup the pixel decoder "VPX" (if installed), a dedicated program called "VPXinit" has been included which can set resolutions, window sizes, color values, inputs (PAL/ NTSC/SVHS) and other characteristics in a menu-driven mode. Default values are available in a test program.

This initialisation can be implemented in the autoexec or other batch file sequences.

Chapter **3**

Configuration

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3. Configuration

3.1 Customer Settings

3.1.1 DIP Switch Settings

On the CP330 there are four DIP switches integrated within one block known as SW2.

Table 3-1: SW2 DIP Switch

Setting	Function		
SW2-1	Selection of EDO/DRAM type (off=EDO=default)		
SW2-2	PID 0	Flat-panel technology and type (please see table 2-1 in chapter 4)	
SW2-3	PID 1		
SW2-4	PID 2		

3.1.2 Pixel Clock Configuration

The pixel clock configuration should only be used in conjunction with the CompactPCI P2 connector.

Table 3-2: Jumper J5 Settings

Position	Function
1-2	*Pixel clock unaltered*
2-3	Pixel clock inverted

If the LVDS transmitter is used via the P2 connector, pins 1 and 2 of J5 must be bridged (non inverted clock). If the display requires the other clock edge, it can be selected on the LVDS receiver board. The LVDS chips require the true (unaltered) clock signal.

> **!** *Attention!*
> Never change jumpers during operation! Your display could be destroyed.

3.2 Pinouts

3.2.1 VGA Interface

The VGA Interface uses a 15 pin D-sub connector, with a standard VGA pinout as illustrated below, and is accessible from the front-panel.

Table 3-3: 15-Pin D-Sub VGA Connector Pinout

Pin No.	Signal
1	Red
3	Blue
5	GND
7	Analog-GND
9	N/A
11	GND
13	Hsync
15	N/A
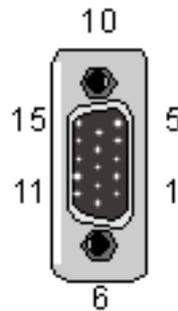
Pin No.	Signal
2	Green
4	GND
6	Analog-GND
8	Analog-GND
10	GND
12	N/A
14	Vsync

3.2.2 S-Video

The video input connector for S-VHS Signals on the CP330 is realised by a 4-pin mini-DIN connector. Optionally, a cinch connector for VHS signals only can be mounted instead.

Figure 3-1: S-VHS Video Input Connector
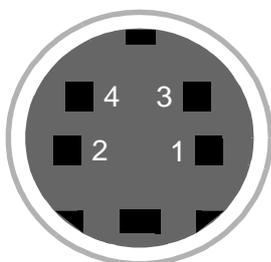
Pinout of the S-VHS connector (Viewed from outside)

Pin 1 : Ground (analog)
Pin 2 : Ground (analog)
Pin 3 : Luminance
Pin 4 : Chrominance

3.2.3   Control Block JP4

Table 3-4: LVDS Receiver Pinout

Pin No.	Signal	Pin No.	Signal	LVDS Reciever
1	ENA VDD 5V-safe	2	CTRL 1	PIn 7
3	ENA VEE 12V -safe	4	CTRL 2	Pin 20
5	Not Used	6	CTRL 3	Pin 23
7	Not Used	8	CTRL 4	Pin 10

Shorting pins 1 and 2 connects 5V-safe which may be used to control the logic supply of the display.

Shorting pins 3 and 4 connects 12V-safe which may power the backlight of a display.

CTL3 and CTL4 may carry keyboard or touch-controller signals.

Pins 1 and 2 may also be used for VHS-signals from a camera and be routed to the video input.

3.2.4   LVDS Connector

The LVDS is a 26-pin MDR (Miniature Delta Ribbon) receptacle.

Table 3-5: Pin - Signal Relationship

Pin	Signal	Property	Comment
1	A0-	LVDS 1-	-
2	A0 GND	LVDS 1 GND	Logic ground
3	A1+	LVDS 2+	-
4	A2-	LVDS 3-	-
5	A2 GND	GND	Logic ground
6	A3+	LVDS 4+	-
7	CTL1	CTL1	May be used for VDD safe, brightness, contrast, keyboard etc.
8	B0 GND	GND	Logic ground
9	B0+	LVDS Clock+	-
10	B1-	CTL4	Not used
11	B2 GND	0V	Power ground
12	B2+	+12V	Display power supply
13	B3-	+5V	Display power supply
14	A0+	LVDS 1+	-
15	A1-	LVDS 2-	-
16	A1 GND	GND	-
17	A2+	LVDS 3+	-
18	A3-	LVDS 4-	-
19	A3 GND	GND	Logic ground
20	CTL2	CTL2	May be used for VEE safe, brightness, contrast, keyboard etc.
21	B0-	LVDS Clock-	-
22	B1 GND	Shield	Housing ground
23	B1+	CTL3	Not used
24	B2-	+12V	Display power supply
25	B3 GND	0V	Power ground
26	B3+	+5V	Display power supply

Figure 3-2: 26-Pin MDR Connector
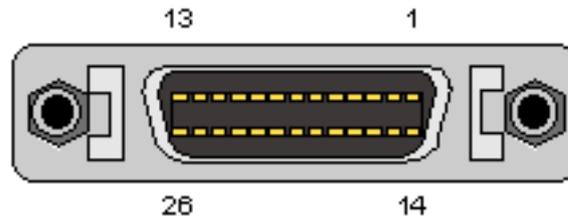
3.2.5   CompactPCI Connector (P1)

Table 3-6: CP330: CompactPCI Connector (P1) Pinout

Pin	A	B	C	D	E	F
22	NC	N/C	N/C	N/C	N/C	N/C
21	NC	N/C	GND	FPFLM	N/C	GND
20	NC	N/C	GND	FPM	N/C	GND
19	NC	N/C	CA7	FPSHFCLK	N/C	GND
18	NC	N/C	CA6	GND	N/C	GND
17	NC	N/C	CA5	GND	N/C	GND
16	NC	N/C	CA4	FP17	N/C	GND
15	NC	N/C	CA3	FP16	N/C	GND
14	NC	N/C	CA2	FP15	N/C	GND
13	NC	N/C	GND	FP14	N/C	GND
12	NC	N/C	GND	FP13	N/C	GND
11	NC	N/C	+ 5V	FP12	N/C	GND
10	NC	N/C	+ 5V	FP11	N/C	GND
9	NC	N/C	GND	FP10	N/C	GND
8	NC	N/C	GND	FP9	FP1	GND
7	NC	N/C	N/C	FP8	FP0	GND
6	NC	N/C	N/C	FP7	GND	GND
5	NC	N/C	FPVDD	FP6	GND	GND
4	NC	N/C	FPVEE	FP5	N/C	GND
3	NC	N/C	ENABKL	FP4	GND	GND
2	NC	N/C	FPM	FP3	+ 12V	GND
1	NC	N/C	FPLP	FP2	+ 12V	GND

3.3 Display Connection

The connection of a flat panel display to the CP330 board differs according to the type of display you want to connect. In the following, connection of the most frequently used display types is described. For the following displays adapters are available.

3.3.1 EL640.480-AF1/AG1/AM1

The following parameters apply to EL640.480-AF1/AG1/AM1 (ICEBrite) displays.

Table 3-7: CP330 Settings (EL640.480-AF1/AG1/AM1)

Switch SW2				Mem. Reqd.	V. Freq.	BIOS	Jumper J5 setting
4	3	2	1				
ON	ON	ON	OFF	307 kBytes	110Hz	> v. 1.0	1-2

Table 3-8: CP330 Settings (EL320.240.36 SGD)

Switch SW2				Mem. Reqd.	V. Freq.	BIOS	Jumper J5 setting
4	3	2	1				
ON	ON	ON	ON	77 kBytes	110Hz	> v. 1.0	1-2

3.3.2 LQ10D345/42 or NL6448AC33-18

The following parameters apply to LQ10D345/42 and NL6448AC33-18 (18-bit TFT) displays.

Table 3-9: CP330 Settings (LQ10D345/42 and NL6448AC33-18)

Switch SW2				Mem. Reqd.	V. Freq.	BIOS	Jumper J4 setting	Jumper J5 setting
4	3	2	1					
OFF	ON	OFF	OFF	1024 kBytes	60Hz	> v. 1.0	1-2, 3-4	1-2

3.3.3 NL6448AC20-06

The following parameters apply to NL6448AC20-06 (18-Bit TFT) displays.

Table 3-10: CP330 Settings (NL6448AC20-06)

Switch SW2				Mem. Reqd.	V. Freq.	BIOS	Jumper J4 Setting	Jumper J5 Setting
4	3	2	1					
OFF	ON	OFF	OFF	1024 kBytes	60Hz	> v. 1.0	1-2, 3-4	1-2

3.3.4   Fujitsu FPF21C8060UA-92

The following parameters apply to Fujitsu FPF21C8060UA-92 (21" Plasma) displays.

Table 3-11: CP330 Settings (Fujitsu FPF21C8060UA-92)

Switch SW2				Mem. Reqd.	V. Freq.	BIOS	Jumper J5 setting
4	3	2	1				
OFF	ON	OFF	OFF	1024 kBytes	60Hz	> v. 1.0	1-2

3.3.5   Display Type - NEC NL10276AC24-01

The following parameters apply to NEC NL10276AC24-01 (1024x768, 12-bit TFT) displays.

Table 3-12: CP330 Settings (NEC NL10276AC24-01)

Switch SW2				Mem. Reqd.	V. Freq.	BIOS	Jumper J4 setting	Jumper J5 setting
4	3	2	1					
OFF	OFF	ON	OFF	1536 kBytes	60Hz	> v. 1.0	1-2, 3-4	1-2

3.3.6   Sharp LQ14X01

The following parameters apply to Sharp LQ14X01 (1024x768 18-Bit TFT) 3x4-bit color displays.

Table 3-13: CP330 Settings (Sharp LQ14X01)

Switch SW2				Mem. Reqd.	V. Freq.	BIOS	Jumper J4 setting	Jumper J5 setting
4	3	2	1					
OFF	OFF	ON	OFF	1536 kBytes	60Hz	> v. 1.0	1-2, 3-4	3-4

3.3.7   Fujitsu FPF42C10660UB-01

The following parameters apply to Fujitsu FPF42C10660UB-01 (42" plasma) displays.

Table 3-14: CP330 Settings (Fujitsu FPF42C10660UB-01)

Switch SW2				Mem. Reqd.	V. Freq.	BIOS	Jumper J5 setting
4	3	2	1				
OFF	OFF	OFF	OFF	1536 kBytes	60Hz	> v. 1.0	1-2

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Chapter 4

BIOS

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4. BIOS

4.1 Panel Selection

Up to 8 different flat-panel types may be selected by setting the DIP switches SW2-2 to SW2-4 on the board. Table 2-3 provides a list of approved displays. Other panels can be added on request.

Important!

Some older motherboards may use an Award BIOS which will only support up to 32k BIOS PROMS. If this is the case, please consult your vendor or change the motherboard.

Table 4-1: Display Type Selection

BIOS Version	SW2-4 PID 2	SW2-3 PID 1	SW2-2 PID 0	Panel Type	Comments
> 1.0	ON	ON	ON	Dual-Scan EL-Monochrome	-
> 1.1	ON	ON	OFF	1280 x 1024 Color	-
> 1.0	ON	OFF	ON	640 x 480 Dual-Scan STN Color	-
> 2.3	ON	OFF	OFF	800 x 600 TFT Color	-
> 1.0	OFF	ON	ON	640 x 480 Sharp TFT Color	-
> 1.0	OFF	ON	OFF	640 x 480 24-bit TFT	≥ v 1.2 True Color
> 1.0	OFF	OFF	ON	1024 x 768 2x12-bit TFT	-
> 1.0	OFF	OFF	OFF	852 x 480 Plasma 24-bit	≥ v 1.2 True Color

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