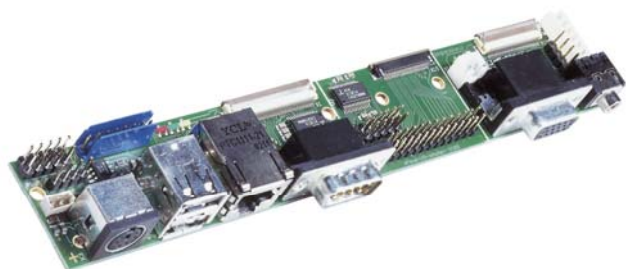
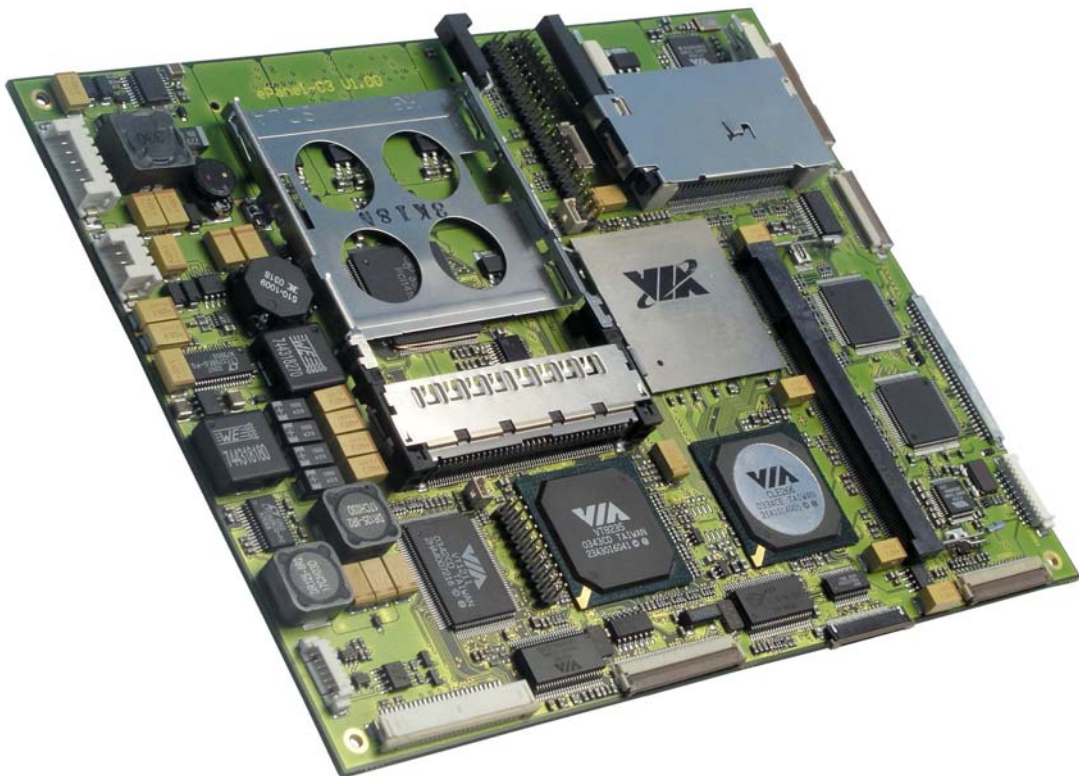


# Technical Manual

## *ePanel-C3*



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## 1.1. User Information

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The information in this document has been carefully checked and is believed to be accurate and reliable. However, no responsibility is assumed for inaccuracies. Furthermore, **Kontron** reserves the right to make changes to any portion of this manual to improve reliability, function or design. **Kontron** does not assume any liability for any product or circuit described herein.

## 1.2. Trademarks

AT and IBM are trademarks of International Business Machines

XT, AT, PS/2 and Personal System/2 are trademarks of International Business Machines Corporation.

Microsoft is a registered trademark of Microsoft Corporation.

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All other products and trademarks mentioned in this manual are trademarks of their respective owners.

## 1.3. General

For the circuits, descriptions and tables indicated no responsibility is assumed as far as patents or other rights of third parties are concerned.

The information in the chapter Technical Descriptions describes the type of the boards and shall not be considered as assured characteristics.

The reproduction, transmission or use of this document or its contents is not permitted without expressed written authority.

Offenders will be liable for damages. All rights created by patent grant or registration of a utility model or design, are reserved.

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## 1.4. Warranty

Each board is tested carefully and thoroughly before being shipped. If, however, problems should occur during operation, please check your user specific settings of all boards included in your system. This is often the source of problems due to resource conflicts. If a board is defective, it can be sent to your supplier for repair. Please take care of the following steps:

1. The board returned should have the factory default settings since a test is only possible with these settings.
2. In order to repair your board as fast as possible we require some additional information from you (detailed description of how and when did the problem occur, what is exactly the problem and so on).
3. Upon receipt of returned boards please be aware that your user specific settings could have been changed during repair.

Within the warranty period the repair is free of charge as long as the warranty conditions are observed.

Because of the high test expenditure you will be charged with the test cost if no fault is found. Repair after the warranty period will be charged.

This **Kontron** product is warranted against defects in material and workmanship for the warranty period from the date of shipment. During the warranty period **Kontron** will at its option either repair or replace defective products.

For warranty service or repair the product must be returned to a service facility designated by **Kontron**.

The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance or handling by buyer, unauthorized modification or misuse, operation outside of the product's environmental specifications or improper installation or maintenance.

**Kontron** will not be responsible for any defects or damages to other products not supplied by **Kontron** that are caused by a faulty **Kontron** product.

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## 1.5. Support, problems and failure analysis

It is not in the responsibility of **Kontron** to supply you with informations about standard PC technology. Please find a selection of different information sources for your convenience in chapter Literature, standards, links

Before contacting **Kontron** please check first our web page for available information (newest manuals, application notes etc.). If you can't solve the problem on your own with this documents, do not hesitate to contact us by email or phone. Please prepare yourself to answer a few questions like

- which **Kontron** module(s) is(are) concerned?
- what serial numbers (xx???????)?
- what BIOS versions?
- since when is this problem known
- is this problem already reported (to whom?)
- and so on...

Preliminary

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## **2. INTRODUCTION**

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### **2.1. Kontron ePanel-Concept**

Time is something no one has enough. „Short time-to-market“ is a nightmare everybody suffers from. A new concept promises a lot of advantages, but how to use them in a non-existent time span? Especially embedded boards are not always easy connectable, think of tangling cables or missing adapters. Kontron recognized this problem and developed the **ePanel**, a platform for OEM and ODM. Its main benefit is the high integration of mobile accessories and components in conjunction with mechanical fit and function. To build a mobile computer, just use a battery, TFT display, inverter and housing and you're set. Now system design and application development gets a great boost forward. Others still look for adapters while your project already ~~struggles~~ to stay close to state-of-the-art computer technologies of the desktop PC market, the ECT business (Embedded Computer Technology) demands adequate processor performance for many applications. There are many standards for CPU boards with a lot of advantages or restrictions. Unfortunately none of these products care about the increasing customer specialization. A board, which fits exactly into a system, is nearly impossible to find but **ePanel** fits nearly for all mobile and space-critical applications. Only a customized module will fulfill all requirements. But away from standard products, a customer has to tolerate long development cycles and costly problems with quick replacements or easy upgrades. The way out of this situation has to join two apparent opposites. The task is to create a customized PC board out of standard parts. Obviously the solution has to be modular. The answer of Kontron for the mobile business : **ePanel**.

#### **Quick integration and nevertheless standard PC technology.**

The **ePanel-C3** is a complete Pentium® III class PC with standard interfaces including USB and additional options such as sound capabilities, PC-Card, touch & matrix controller, TV-In-and output, flatpanel interface, and 100 MBit Ethernet, etc.

#### **Smallest Dimensions to meet smallest space requirements.**

With 252 cm<sup>2</sup> the **ePanel-C3** uses only a little more space compared to a current slot CPU, which needs 219 cm<sup>2</sup>. But the most surprising fact is the module height. The **ePanel-C3** measures only 21mm!

#### **How about the ISA bus?**

The only way to extend the capabilities of the board is to plug in PC-Cards or Mini-PCI-boards. No other bus systems are supported.

#### **There must be replacements or upgrades for future requirements.**

**Kontron** will expand and improve this innovative and handy ePanel concept. New PC technologies will be obtainable the same way as in other Kontron product families.

An **ePanel board** does not force you in excessive and expensive cabling. Only the really demanded interfaces are linked to the corresponding connectors. The decision is up to you, which one you call for or which one to skip. Evaluation adapters and kits are available.

#### **The application requests low power Pentium® III performance.**

Don't worry about that. Depending on OS and used options, the **ePanel-C3** consumes between 12..19 Watts depending on input voltage and CPU speed.

#### **Finally the system passed all the tests and now?**

Nothing special, just start mass production. **Kontron** knows about the short life cycles of PC products. Therefore we secured by suitable methods, that longevity is one of the most excellent characteristics of the **ePanel family**.

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## 2.2. ePanel-C3

The **ePanel-C3** is an extreme compact VIA Eden based PC module with consistent low power design. It is now possible to create modular systems, combining exchangeable CPU performance with systems, carrying only the connectors and additional functions needed. This reduces development costs and speeds up application design. Despite the very little board dimensions, the **ePanel-C3** offers all standard interfaces such as sound, Ethernet, USB and graphic. The fully compliant AC97 soundchip is supported by most operating systems. For networking purposes the **ePanel-C3** comes with a 10/100 Mbit Ethernet controller which allows an easy Intranet/Internet access. Total communication interfaces like 2 serial TTL ports, an EPP/ECP parallel port, Floppy-interface, **touch & matrix controller**, TV-Input and optional TV-Output, three USB 2.0 ports, PC-Card controller, 10/100 Mbit Ethernet, **battery charger for smart batteries** and a **wide range DC power supply**. You're looking for a secure and EMI tolerant boot medium? A compact flash socket for commercial CF-cards is already integrated on the module. For further expansions one additional IDE port is available.

Preliminary

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## 3. FEATURES

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- **32-bit x86 processor**

Available with VIA EDEN ESP3000 (300 MHz), ESP7000 (733 MHz) or ESP10000 (1 GHz) for low power Applications, internal L1 Cache 128KB and 64KB L2 Cache

- **Chipset**

VIA CLE266 North Bridge and VIA VT8235 South Bridge

- **Power Supply**

Wide range power supply : 8V DC up to 28V DC  
Battery power supply with Smart battery packs : 7V DC up to 18.4V DC  
Integrated charging unit for batteries up to 18V

- **Memory support, 64-bit DDR-RAM interface**

One DDR-SO-DIMM Socket max. 1 GB

- **Two serial ports (COM1 and COM2)**

TTL signals only

- **One parallel port, LPT1**

EPP and ECP capability

- **Floppy-interface**

Support for 720 KB and 1.44 MB density

- **EIDE-PCI-hard disk-interface**

- 2 x PCI Bus Master IDE ports (up to 3 IDE Devices)
- Compact Flash socket as Primary Master
- 44 pin IDE connector as secondary Master/Slave

- **Three USB 2.0 ports , OpenHCI specification compliant**

USB Legacy support  
USB boot support

- **PS/2-Mouse**

- **IrDA interface**

- **512 KByte FLASH-BIOS**

- **Real Time Clock**

- **Keyboard Controller**

- 
- **NV-Storage for CMOS-SETUP**
  
  - **Onboard Ethernet 10BASE-T/100BASE-TX LAN**
    - VIA VT6103 10/100Mbit Base-T
  
  - **Onboard VGA/LCD controller**
    - VIA CLE266 with integrated VIA AGP Castle Rock Engine with MPEG-2 Decoder and 16, 32 or 64 MB shared memory
  
    - Output:
      - Single VGA/CRT
      - 1 x TTL (FLEX32; 1x18 Bit)
      - 2 x LVDS (JILI, JILI 30; 2 x 24 Bit)
      - TV-Out
      - S-Video
      - Composite-Video
  
    - Resolution VGA up to UXGA
  
  - **Audio Codec VIA VT1616 AC97, Line In, Line Out, Mic in**
  
  - **Onboard compact flash socket for commercial Type II CF-cards (Master on primary IDE)**
  
  - **Onboard PC-Card socket for Wireless LAN, Bluetooth, ISDN or modem cards**
  
  - **NTSC/PAL Philips SAA7118 multistandard video decoder with capture (max. 16 x input)**
  
  - **Power management, ACPI 1.0 compliant**
  
  - **Onboard 4/5/8-wire touch controller**
  
  - **Onboard 8x8 keyboard matrix controller**

## 4. RESOURCE LIST AND I/O MAP

IRQ #	Used for	available	comment
0	Timer0	No	
1	Keyboard	No	
2	Cascade	No	
3	COM2	No	
4	COM1	No	
5	USB	No	
6	FDC	No	
7	LPT1	No	
8	RTC	No	
9	Cascade	No	
10	USB/Audio/Ethernet	No	PCI Interrupt sharing
11	USB/VGA/PC-Card	No	PCI Interrupt sharing
12	PS/2 Mouse	No	
13	FPU	No	
14	IDE0	No	
15	IDE1	No	

DMA #	Used for	available	comment
0		Yes	
1		Yes	
2	FDC	No	
3		Yes	
4	Cascade	No	
5		Yes	
6		Yes	
7		Yes	

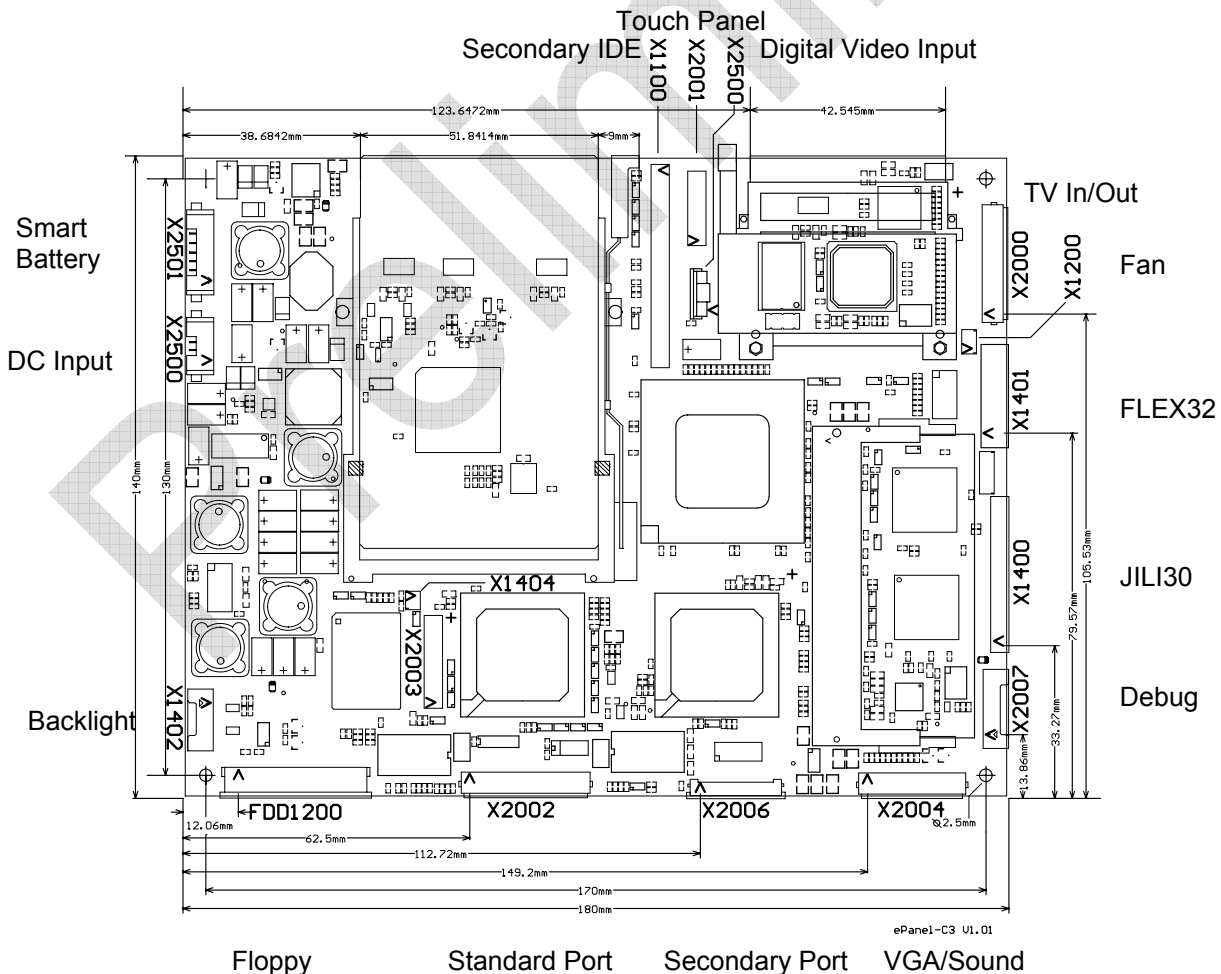
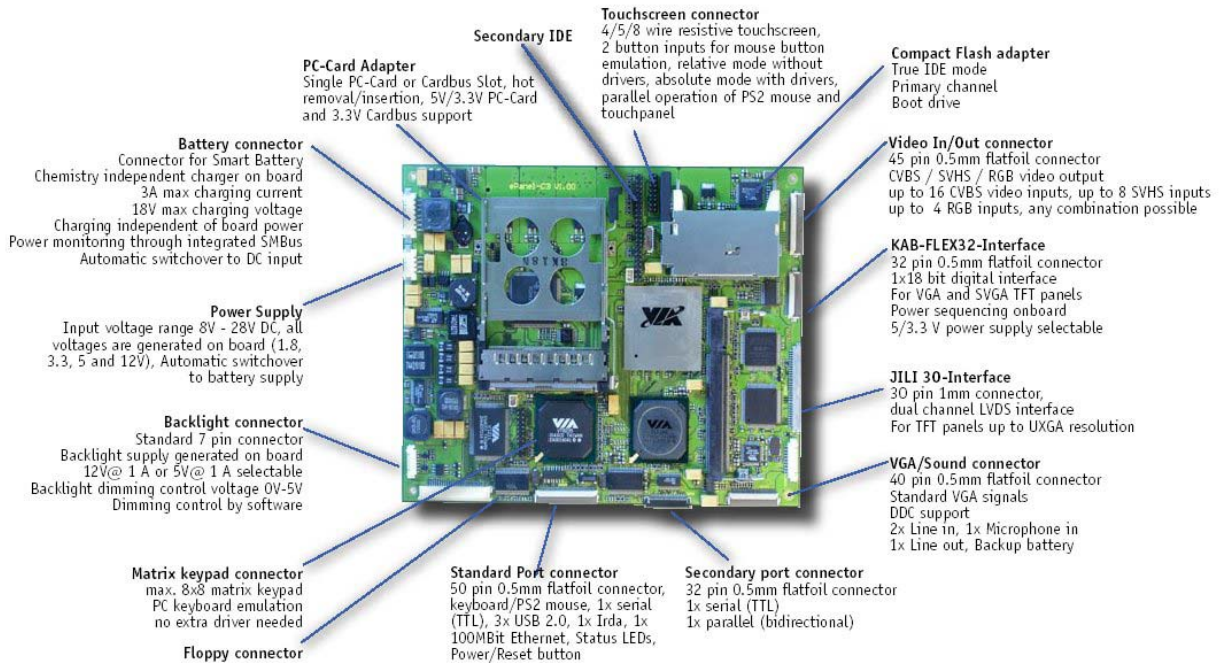
Upper Memory	used for	Available	comment
C0000h – CBFFFh	VGA BIOS	No	
CC000h – CFFFFh	System-BIOS	No	
D0000h – DFFFFh	Plug&Play	No	
E0000h – EFFFFh	System-BIOS	No	
F0000h – EC000h	System BIOS	No	

The I/O-port addresses of the ePanel-C3 are functionally identical with a standard PC/AT.  
Following the additional I/O ports which are used on this board:

I/O addr.	used for	available	comment
20-3F	Master Interrupt	No	
40-5F	Timer Counter	No	
60-6F	Keyboard Controller	No	
60h	KBC Data	No	
61h	Misc Functions & Spkr	No	
64h	KBC Command / Status	No	
70-77	RTC/CMOS/NMI-Disable	No	
81-8F	DMA Page Registers	No	
A0-BF	Slave Interrupt Controller	No	
C0-DF	Slave DMA Controller	No	
170-17F	Secondary IDE	No	
1F0-1F7	Primary IDE	No	
2F8-2FF	COM2	No	
378-3FF	LPT1	No	
3F8-3FF	COM1	No	
3B0-3DF	VGA	No	
3F2-3F7	Disk controller	No	
CFC-CFF	PCI Configuration Data	No	
CF8-CFB	PCI Configuration Address	No	

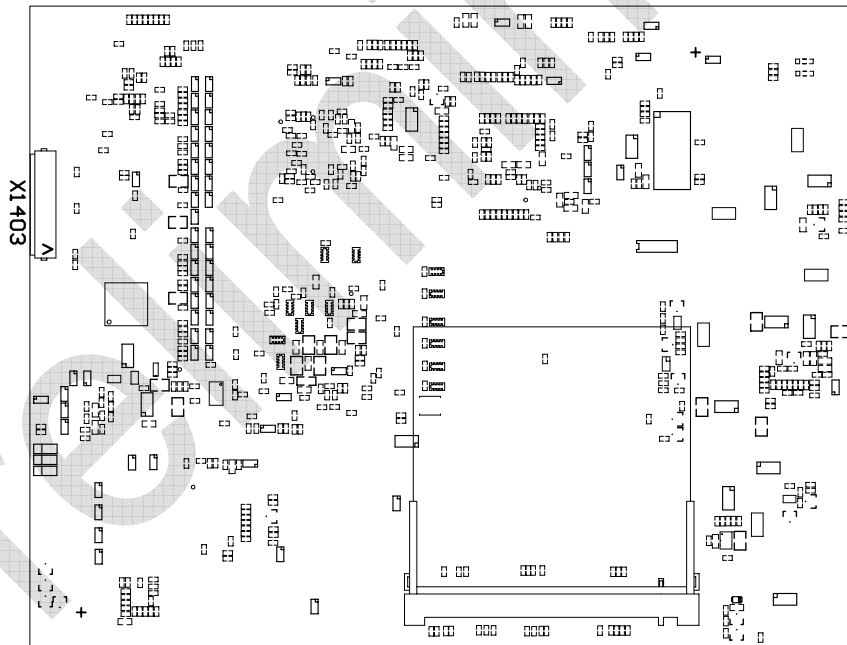
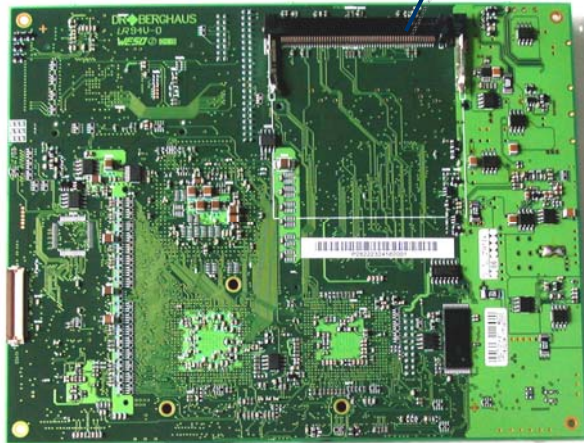
# 5. CONNECTOR LOCATIONS AND PINOUTS

## 5.1. Connectors



Find more detailed information about the connectors in chapter "5.2 Connector Pinouts"

Mini -PCI



*Find more detailed information about the connectors in chapter “5.2 Connector Pinouts”*

## 5.2. Connector pinouts

Pin-No.	Smart Battery Connector	DC Input Connector	Backlight Connector	Floppy Connector	Matrix Keyboard Connector	Touch Panel Connector 4/5/8Wire	Debug Connector	Pin-No.
	X2501	X2500	X1402	FDD1200	X2003	X2001	X2007	No.
1	BAT+	+DCIN	NC	VCC5	GND	GND	GND	1
2	BAT+	+DCIN	BKLT_ADJ	INDEX#	VCC3	YB	+5VDUAL	2
3	BATT_SCL	GND	GND	VCC5	KB_DO0	SYB	+3V3DUAL	3
4	BATT_SDA	GND	BKLT_SW	DR0#	KB_DO1	GND	VCC5	4
5	THM		BKLT_SW	VCC5	KB_DO2	YT	VCC5	5
6	GND		GND	DSKCHG#	KB_DO3	SYT	DDC_SCL	6
7	GND		BKLT_ON	NC	KB_DO4	GND	DDC_SDA	7
8				NC	KB_DO5	XL	GND	8
9				NC	KB_DO6	SXL	VCC12	9
10				MTR0#	KB_DO7	GND	BCKBAT+	10
11				NC	GND	XR		11
12				FDIR#	VCC3	SXR		12
13				NC	KB_DI0	GND		13
14				STEP#	KB_DI1	TRB#		14
15				GND	KB_DI2	TLB#		15
16				WDATA#	KB_DI3	GND		16
17				GND	KB_DI4			17
18				WGATE#	KB_DI5			18
19				GND	KB_DI6			19
20				TRK0#	KB_DI7			20
21				GND				21
22				WRTPRT#				22
23				GND				23
24				RDATA#				24
25				GND				25
26				HDSEL#				26

### 5.3. Connector pinouts

Pin-No.	Secondary IDE Connector	TV-Out/In Connector	Flatpanel (FLEX32) Connector	Flatpanel (JILI) Connector	VGA/Sound Connector	COM2/LPT1 Connector	USB/COM1/KEYB/PS2/Ethernet Connector	Pin-No.
	X1100	X2000	X1401	X1403	X2004	X2006	X2002	No.
1	IDE_RST#	GND	GND	NC	GND	VCC5	VCC5	1
2	GND	CVBS_IN1	PCLK	FTX0-	AUX_L	GND	KBCLK	2
3	IDE_D7	GND	PHS	FTX0+	GND	DSR2#	KBDAT	3
4	IDE_D8	CVBS_IN2	PVS	FPVDD	AUX_R	DCD2#	GND	4
5	IDE_D6	GND	GND	FTX1-	GND	DTR2#	MDAT	5
6	IDE_D9	Y_IN1	PR0	FTX1+	VLINE_L	RTS2#	MCLK	6
7	IDE_D5	GND	PR1	NC	GND	CTS2#	GND	7
8	IDE_D10	C_IN1	PR2	FTX2-	VLINE_R	SIN2	DSR1#	8
9	IDE_D4	GND	PR3	FTX2+	GND	SOUT2	DCD1#	9
10	IDE_D11	Y_IN2	PR4	GND	CD_L	RI2#	DTR1#	10
11	IDE_D3	GND	PR5	FTXC-	GND	GND	RTS1#	11
12	IDE_D12	C_IN2	GND	FTXC+	CD_R	AFD#	CTS1#	12
13	IDE_D2	GND	PG0	GND	GND	STB	SIN1	13
14	IDE_D13	Y_IN3	PG1	FTX3-	MIC	ERR#	SOUT1	14
15	IDE_D1	GND	PG2	FTX3+	GND	PD0	RI1#	15
16	IDE_D14	C_IN3	PG3	JILI_SDA	LINE_L	INIT#	GND	16
17	IDE_D0	GND	PG4	STX0-	GND	GND	IRRX1	17
18	IDE_D15	RGB_SYNC1	PG5	STX0+	LINE_R	PD1	IRTX1	18
19	GND	GND	GND	JILI_SCL	GND	SLIN#	GND	19
20	NC	RGB_RED1	PB0	STX1-	VCC5	PD2	VCC5	20
21	IDE_DRQ	GND	PB1	STX1+	VCC5	PD3	VCC5	21
22	GND	RGB_GREEN1	PB2	NC	VCC5	GND	VCC5	22
23	IDE_IOW#	GND	PB3	STX2-	VCC5	PD4	VCC5	23
24	GND	RGB_BLUE1	PB4	STX2+	GND	PD5	VCC5	24
25	IDE_IOR#	GND	PB5	GND	VGA_GREEN	PD6	VCC5	25
26	GND	RGB_SYNC2	GND	STXC-	GND	PD7	OVRCUR#	26
27	IDE_IORDY	GND	PDE	STXC+	VGA_BLUE	GND	GND	27
28	IDE_SEL	RGB_RED2	PANEL_VCC	GND	GND	ACK#	USB0+	28
29	IDE_DACK#	GND	PANEL_VCC	STX3-	VGA_RED	BUSY#	USB0-	29
30	GND	RGB_GREEN2	R/L	STX3+	GND	PE	GND	30
31	IDE_IRQ	GND	U/D	VCC5	DDC_SDA	SLCT	USB1+	31
32	NC	RGB_BLUE2	RESERVED	VCC5	DDC_SCL	GND	USB1-	32
33	IDE_A1	GND	GND	VCC5	GND		GND	33
34	DIAG_P	GND		VCC5	VGA_VS		USB2+	34
35	IDE_A0	CVBS/RGB_B		BKLT_ON	GND		USB2-	35
36	IDE_A2	GND		GND	VGA_HS		GND	36
37	IDE_CS0#	SVC/RGB_R		GND	GND		RXD+	37
38	IDE_CS1#	GND		VCC12	SPDIF_OUT		RXD-	38

## 5.4. Connector pinouts

Pin-No.	IDE Connector	TV-Out/In Connector		Flatpanel (JLI) Connector	VGA/Sound Connector		USB/COM1/KEYB/PS2/Ethernet Connector	Pin-No.
	X1100	X2000		X1403	X1402		X2002	No.
39	NC	SVY/RGB_G		VCC12	NC		GND	39
40	GND	GND		VCC12	BCKBAT+		TXD+	40
41	VCC5	CVBS					TXD-	41
42	VCC5	GND					GND	42
43	GND	VCC3					LILED	43
44	NC	VCC3					SPEEDLED	44
45		VCC5					ACTLED	45
46							VCC3	46
47							PWR_LED#	47
48							MRESET#	48
49							PWRBTN#	49
50							GND	50

## 5.5. Connector pinouts

Pin-No.	Digital Video Input	Flatpanel (JIL130) Connector		Fan Connector	Backlight Compensation Input			Pin-No.
	X2005	X1400		X1200	X1404			No.
1	+3,3V	FTX0-		UFAN	VTIN			1
2	YUV0	FTX0+		FANIN	GND			2
3	YUV1	FTX1-		GND				3
4	YUV2	FTX1+						4
5	YUV3	FTX2-						5
6	YUV4	FTX2+						6
7	YUV5	GND						7
8	YUV6	FTXC-						8
9	YUV7	FTXC+						9
10	GND	FTX3-						10
11	RDY	FTX3+						11
12	CLK	STX0-						12
13	DQ	STX0+						13
14	RH	GND						14
15	RV	STX1-						15
16		STX1+						16
17		GND						17
18		STX2-						18
19		STX2+						19
20		STXC-						20
21		STXC+						21
22		STX3-						22
23		STX3+						23
24		GND						24
25		SDA						25
26		DATAENA						26
27		SCL						27
28		PANEL_VCC						28
29		PANEL_VCC						29
30		PANEL_VCC						30

---

## 5.6. Pin descriptions

### 5.6.1. Connector X2004 ( VGA / Sound )

#### **BCKBAT+**

3V backup cell input. BATT should be connected to a 3V backup cell for RTC operation and storage register non-volatility in the absence of system power. (typ. VBATT = 3V to 3.3V)

#### **VGA\_HS**

Horizontal Sync: This output supplies the horizontal synchronization pulse to the monitor. It is normally not needed for flat panels (TTL).

#### **VGA\_VS**

Vertical Sync: This output supplies the vertical synchronization pulse to the monitor. It is normally not needed for flat panels (TTL).

#### **VGA\_RED, VGA\_GREEN, VGA\_BLUE**

CRT analog video outputs. Max. output voltage is 0.7Vpp.

#### **DDC\_SCL, DDC\_SDA**

Bidirectional open collector DDC signals with TTL level.

#### **AUX\_L**

Auxiliary input left. Normally intended for connection to external CD-ROM analog output. Max. input voltage is 0.7Vpp.

#### **AUX\_R**

Auxiliary input right. Normally intended for connection to external CD-ROM analog output. Max. input voltage is 0.7Vpp.

#### **VLINEL**

Line-level stereo input left. Max. input voltage is 0.7Vpp.

#### **VLINER**

Line-level stereo input right. Max. input voltage is 0.7Vpp.

#### **LINE\_L**

Line-level stereo output left. This pin can drive a 5k Ohm AC load. Max. output voltage is 0.7Vpp.

#### **LINE\_R**

Line-level stereo output right. This pin can drive a 5k Ohm AC load. Max. output voltage is 0.7Vpp.

#### **CD\_L**

CD Line-level stereo input left. Max. input voltage is 0.7Vpp.

#### **CD\_R**

CD Line-level stereo input right. Max. input voltage is 0.7Vpp.

#### **CD\_GND**

CD Line input Ground.

#### **MIC**

Microphone input. Max. input voltage is 0.7Vpp.

#### **SPDIF\_OUT**

Digital I/F Output

---

### 5.6.2. Connector X1403 (JILI-Flatpanel-Interface)

#### JILI\_SCL, JILI\_SDA

These two pins are functionally suitable for a JILI interface between the graphics controller chip and the flatpanel cable. Open collector bidirectional signals ( LVTTTL).

#### FPVDD

Controls panel digital power. LVTTTL output.

#### BKLT\_ON

Backlight power control signal. LVTTTL output.

#### FTX0..3

Differential LCD data output Signals for LVDS support (First port LVDS output).

#### FTXC+-

Differential LCD clock pair output for LVDS support (First port LVDS output).

#### STX0..3

Differential LCD data output Signals for LVDS support (Second port LVDS output).

#### STXC+-

Differential LCD clock pair output for LVDS support (Second port LVDS output).

### 5.6.3. Connector X1400 (JILI30-Flatpanel-Interface)

#### FTX0..3

Differential LCD data output Signals for LVDS support (First port LVDS output).

#### FTXC+-

Differential LCD clock pair output for LVDS support (First port LVDS output).

#### STX0..3

Differential LCD data output Signals for LVDS support (Second port LVDS output).

#### STXC+-

Differential LCD clock pair output for LVDS support (Second port LVDS output).

#### SCL, SDA

These two pins are functionally suitable for a JILI interface between the graphics controller chip and the flatpanel cable. Open collector bidirectional signals ( LVTTTL).

#### DATAENA

Data enable signal for flatpanel.

#### Panel\_VCC

Switched Power supply for flatpanel. **Caution:** Adjust correct voltage setting, default value R1410 = +5V

---

## 5.6.4. Connector X2002 ( USB / COM1 / KEYB / PS2 / Ethernet )

### DTR1#

Active low data terminal ready output for the serial port. Handshake output signal notifies modem that the UART is ready to establish data communication link (TTL).

### RI1#

Active low input for the serial port. Handshake signal which notifies the UART that the telephone ring signal is detected by the modem (TTL).

### SOUT1

Transmitter serial data output from Serial port (TTL).

### SIN1

Receiver serial data input (TTL).

### CTS1#

Active low input for serial port. Handshake signal which notifies the UART that the modem is ready to receive data (TTL).

### RTS1#

Active low output of serial port. Handshake signal notifies the modem that the UART is ready to transmit data (TTL).

### DCD1#

Active low input for serial port. Handshake signal which notifies the UART that carrier signal is detected by the modem (TTL).

### DSR1#

Active low input for serial port. Handshake signal which notifies the UART that the modem is ready to establish the communication link (TTL).

### KBDAT

Keyboard data signal (TTL).

### KBCLK

Keyboard clock signal (TTL).

### MDAT

Mouse data signal (TTL).

### MCLK

Mouse clock signal (TTL).

### IRTX1, IRRX1

Infrared transmit and receive pin (LVTTTL).

### TXD-, TXD+

Analog Twisted Pair Ethernet Transmit Differential Pair. These pins transmit the serial bit stream for transmission on the Unshielded Twisted Pair (UTP) cable. The current-driven differential driver can be two-level (10BASE-T) or three-level (100BASE-TX) signals depending on the mode of operation. These signals interface directly with an isolation transformer.

### RXD-, RXD+

Analog Twisted Pair Ethernet Receive Differential Pair. These pins receive the serial bit stream from the isolation transformer. The bit stream can be two-level (10BASE-T) or three-level (100BASE-TX) signals depending on the mode of operation.

### ACTLED

The Activity LED pin indicates either transmit or receive activity. When activity is present, the activity LED is on; when no activity is present, the activity LED is off.

---

**LILED**

The Link Integrity LED pin indicates link integrity. If the link is valid in either 10 or 100 Mbps, the LED is on; if link is invalid, the LED is off.

**SPEEDLED**

The Speed LED pin indicates the speed. The speed LED will be on at 100 Mbps and off at 10 Mbps.

**USB0+, USB0-**

Universal Serial Bus Port 0. These are the serial data pairs for USB Port 0.

**USB1+, USB1-**

Universal Serial Bus Port 1. These are the serial data pairs for USB Port 1.

**USB2+, USB2-**

Universal Serial Bus Port 2. These are the serial data pairs for USB Port 2.

**OVRCUR#**

Over current detect input. This pin is used to monitor the USB power over current. Max. input voltage is 3.3 V DC.

**USBEN**

This output enables the USB ports. This pin is used to enable the USB power switch.

**PWRBTN#**

Power Button Input. This input is used to support the ACPI Power Button function. Used to power up or down the board and to resume from suspend mode. Max. input voltage is 3.3 V DC.

**PWR\_LED#**

The LED# pin indicates the power status of the board. The LED# pin is an open collector output and will sink current to the connected LED if the device is active, will blink in suspend mode or will be inactive if the device is switched off.

**MRESET#**

The Manual Reset input pin. Short to ground will reset the device. Max. input voltage is 3.3 V DC.

---

### 5.6.5. Connector X2006 ( COM2 / LPT1 )

All signals are TTL compatible.

**STB**

Active low pulse is used to strobe the printer data into the printer.

**AFD#**

Active low output causes the printer to automatically feed one line after each line is printed.

**PD0..PD7**

Bi-directional parallel data bus is used to transfer information between CPU and peripherals.

**ERR#**

Active low signal indicates an error situation at the printer.

**INIT#**

Active low signal used to initiate the printer when low.

**SLIN#**

Active low signal selects the printer.

**ACK#**

Active low output from the printer indicates it has received the data and is ready to receive new data.

**BUSY#**

Indicates the printer is busy and not ready to receive new data.

**PE**

Indicates that the printer is out of paper.

**SLCT**

Active high output from the printer indicates that it has power on.

**DTR2#**

Active low data terminal ready output for the serial port. Handshake output signal notifies modem that the UART is ready to establish data communication link.

**RI2#**

Active low input handshake signal which notifies the UART that the telephone ring signal is detected by the modem.

**SOUT2**

Transmitter serial data output from Serial port.

**SIN2**

Receiver serial data input.

**CTS2#**

Active low input handshake signal which notifies the UART that the modem is ready to receive data.

**RTS2#**

Active low output handshake signal notifies the modem that the UART is ready to transmit data.

**DCD2#**

Active low input handshake signal which notifies the UART that carrier signal is detected by the modem.

**DSR2#**

Active low input handshake signal which notifies the UART that the modem is ready to establish the communication link.

---

## 5.6.6. Connector FDD1200 ( Floppy )

All signals are TTL compatible.

### **DR0#**

Drive select 0.

### **INDEX#**

Active low Schmitt Trigger input signal senses from the disk drive that the head is positioned over the beginning of a track, as marked by an index hole.

### **TRK0#**

Active low Schmitt Trigger input signal senses from the disk drive that the head is positioned over the outermost track.

### **WRTprt#**

Active-low Schmitt Trigger input signal senses from the disk drive that a disk is write-protected.

### **RDATA#**

Active-low, raw data read signal from the disk is connected here. Each falling edge represents a flux transition of the encoded data.

### **DSKCHG#**

Disk interface input indicates when the disk drive door has been opened. This active-low signal is read from bit D7 of location base+7.

### **MTR0#**

Active-low output selects motor drives 0.

### **HDSEL#**

Active low output determines which disk drive head is active. Low = Head 0, high (open) = Head 1.

### **FDIR#**

Active low output determines the direction of the head movement (low = step-in, high = step-out).

### **STEP#**

Active low output signal produces a pulse at a software-programmable rate to move the head during a seek operation.

### **WDATA#**

Active low output is a write- precompensated serial data to be written onto the selected disk drive. Each falling edge causes a flux change on the media.

### **WGATE#**

Active-low, high-drive output enables the write circuitry of the selected disk drive.

### 5.6.7. Connector X1100 ( Secondary IDE )

All signals are LVTTTL compatible.

#### **IDE\_D0..15**

IDE ATA Data Bus. These are the Data pins connected to Secondary Channel.

#### **IDE\_A0..2**

IDE ATA Address Bus. These are the Address pins connected to Secondary Channel.

#### **IDE\_CS0#**

IDE Chip Select 1 for Secondary Channel 0. This is the Chip Select 1 command output pin to enable the Secondary IDE device to watch the Read/Write Command.

#### **IDE\_CS1#**

IDE Chip Select 3 for Secondary Channel 1. This is the Chip Select 3 command output pin to enable the Secondary IDE device to watch the Read/Write Command.

#### **IDE\_DRQ**

IDE DMA Request for IDE Master. This is the input pin from the Channel IDE DMA request to do the IDE Master Transfer. It will active high in DMA or Ultra-33 mode and always be inactive low in PIO mode.

#### **IDE\_DACK#**

IDE DACKJ for IDE Master. This is the output pin to grant the Channel IDE DMA request to begin the IDE Master Transfer in DMA or Ultra-33 mode.

#### **IDE\_IORDY**

IDE Ready. This is the input pin from the IDE Channel to indicate the IDE device is ready to terminate the IDE command in PIO mode. The IDE device can de-assert this input (logic 0) to expand the IDE command if the device is not ready. In Ultra-33 mode, this pin has different functions. In read cycle, IDE device will drive this signal as Data Strobe (DSTROBE) to use by IDE Busmaster to strobe the input data. In write cycles, this pin is used by IDE device to notify IDE Busmaster as DMA Ready (DDMARDYJ).

#### **IDE\_IOR#**

IDE IORJ Command. This is the IORJ command output pin to notify the IDE device to assert the Read Data in PIO and DMA mode. In Ultra-33 mode, this pin has different function. In read cycle, this pin is used by IDE Busmaster to notify IDE device as DMA Ready (DDMARDYJ). In write cycle, IDE Busmaster will drive this signal as Data Strobe (DSTROBE) to use by IDE device to strobe the output data.

#### **IDE\_IOW#**

IDE IOWJ Command. This is the IOWJ command output pin to notify the IDE device that the available Write Data is already asserted by IDE Busmaster in PIO and DMA mode. In Ultra-33 mode, this pin is driven by IDE Busmaster to force IDE device to terminate current transaction. After receiving this input, IDE device will de-assert DRQ to STOP current transaction.

#### **DIAG\_P**

Output by the drive if it is jumpered in the slave mode; input to the drive if it is jumpered in the master mode. The signal indicates to a master that the slave has passed its internal Diagnostic command. Necessary for using IDE master/slave-mode on Secondary IDE channel.

#### **IDE\_SEL**

IDE Cable select (470R to Ground)

Used to configure this device as a Master or a Slave. When the pin is grounded, this device is configured as a Master. When the pin is open, this device is configured as a Slave.

#### **IDE\_RST#**

Low active hardware reset (RSTDRV inverted).

#### **IDE\_IRQ**

IDE channel interrupt signal.

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### 5.6.8. Connector X2501 ( Smart Battery System )

**BAT+**

Connect to positive terminal of battery.

**GND**

Connect to negative terminal of battery.

**BATT\_SDA**

Smart battery data bus signal. Open collector bidirectional (TTL).

**BATT\_SCL**

Smart battery clock signal. Open collector bidirectional (TTL).

**THM**

Thermal monitor input signal. Analog input, max. input voltage is 4V DC.

### 5.6.9. Connector X2500 ( DC Power Input )

**+DCIN**

Main power supply input (+8V up to +28V DC).

**GND**

Main power supply ground.

### 5.6.10. Connector X1402 ( Backlight )

**BKLT\_ADJ**

0V up to +5V DC brightness control signal.

**BKLT\_SW**

Switched Backlight power supply. 5V or 12V selectable by J1400. default value 12V

**BKLT\_ON**

Backlight on/off control signal (TTL). Polarity selectable by J1402, default value active high

### 5.6.11. Connector X1404 ( Backlight Compensation )

**VTIN**

Optional (Sense input for variable Resistor. Max. input voltage is 2.5 VDC)

### 5.6.12. Connector X1200 ( FAN )

**UFAN**

+5V Fan Power output, max. 250 mA

**FANIN**

Sense input to detect fan speed, max. input voltage 5V DC.

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### 5.6.13. Connector X2003 ( Matrix Keyboard )

#### KB\_DO 0..07

Matrix keyboard outputs. Max. output voltage is 3.3V DC.

#### KB\_DI 0..17

Matrix keyboard inputs. Max. input voltage is 3.3V DC.

### 5.6.14. Connector X2001 ( Touch Panel )

#### YB

Touchpanel bottom driving signal.  
SW (Southwest) ) input for 5-wire touchpanels

#### SYB

Touchpanel bottom sensing signal. For 4-wire touchpanels connect to YB.

#### YT

Touchpanel top driving signal.  
NE (Northeast) ) input for 5-wire touchpanels

#### SYT

Touchpanel top sensing signal. For 4-wire touchpanels connect to YT.

#### XL

Touchpanel left driving signal.  
NW (Northwest) ) input for 5-wire touchpanels

#### SXL

Touchpanel left sensing signal. For 4-wire touchpanels connect to XL.

#### XR

Touchpanel right driving signal.  
SE (Southeast) input for 5-wire touchpanels

#### SXR

Touchpanel right sensing signal. For 4-wire touchpanels connect to XR.

#### TRB#

Touchpanel right mouse button. Open collector input. Max. input voltage is 5V DC.

#### TLB#

Touchpanel left mouse button. Open collector input. Max. input voltage is 5V DC.  
For 5-wire touchpanels connect to Sense.

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### 5.6.15. Connector X2007 ( Aux Interface )

#### DDC\_SCL, DDC\_SDA

These two pins are functionally suitable for a DDC interface between the graphics controller chip and the CRT monitor. Open collector bidirectional signals with TTL level ( Pulled up ).

#### BCKBAT+

3V backup cell input. BATT should be connected to a 3V backup cell for RTC operation and storage register non-volatility in the absence of system power. (VBATT = 3V to 3.3V DC)

### 5.6.16. Connector X1401 ( FLEX32 Interface )

All signals are LVTTTL compatible.

#### PR0-PR5

Red color data lines for flatpanel.

#### PG0-PG5

Green color data lines for flatpanel.

#### PB0-PB5

Blue color data lines for flatpanel.

#### PCLK

Data shift clock for flatpanel.

#### PHS

Horizontal sync pulse for flatpanel.

#### PVS

Vertical sync pulse for flatpanel.

#### PDE

Data enable signal for flatpanel.

#### Panel\_VCC

Switched Power supply for flatpanel. **Caution:** Adjust correct voltage setting, default value R1410 = +5V.

#### R/L

Rotate image in right or left direction. Adjust correct setting with JP1400.

#### U/D

Rotate image up or down. Adjust correct setting with JP1401.

### 5.6.17. Connector X2005 (Extended Digital Video Port )

Reserved.

### 5.6.18. Connector X2000 ( TV-Out/In )

#### CVBS\_IN1

Video input signal for CVBS, channel 1. Max input voltage is 1Vpp.

#### CVBS\_IN2

Video input signal for CVBS, channel 2. Max input voltage is 1Vpp.

#### Y\_IN1

Video input signal for Y component, channel 1. Max input voltage is 1Vpp.

#### C\_IN1

Video input signal for C component, channel 1. Max input voltage is 1Vpp.

#### Y\_IN2

Video input signal for Y component, channel 2. Max input voltage is 1Vpp.

#### C\_IN2

Video input signal for C component, channel 2. Max input voltage is 1Vpp.

#### Y\_IN3

Video input signal for Y component, channel 3. Max input voltage is 1Vpp.

#### C\_IN3

Video input signal for C component, channel 3. Max input voltage is 1Vpp.

#### RGB\_SYNC1

Sync pulse for RGB video input signal, channel 1. Max input voltage is 1Vpp.

#### RGB\_SYNC2

Sync pulse for RGB video input signal, channel 2. Max input voltage is 1Vpp.

#### RGB\_RED1

Red input signal, channel 1. Max input voltage is 1Vpp.

#### RGB\_RED2

Red input signal, channel 2. Max input voltage is 1Vpp.

#### RGB\_GREEN1

Green input signal, channel 1. Max input voltage is 1Vpp.

#### RGB\_GREEN2

Green input signal, channel 2. Max input voltage is 1Vpp.

#### RGB\_BLUE1

Blue input signal, channel 1. Max input voltage is 1Vpp.

#### RGB\_BLUE2

Blue input signal, channel 2. Max input voltage is 1Vpp.

#### CVBS/RGB\_G

Second Composite video out / Green Component video out. Max output voltage is 1Vpp. (optional)

#### SVC/RGB\_B

Chrominance video out / Component BLUE video out. Max output voltage is 1Vpp. (optional)

#### SVY/RGB\_R

Luminance video out / Component RED video out. Max output voltage is 1Vpp. (optional)

#### CVBS

Composite video out. Max output voltage is 1Vpp. (optional)

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## 6. BIOS-DESCRIPTION

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The **ePanel-C3** is equipped with an AMI Software BIOS which is located in a Flash EPROM on board. This device has 8bit wide access. Faster access is provided by the shadowing to BIOS to RAM.

### 6.1. The Setup Guide

With the AMI BIOS Setup program, you can modify BIOS settings and control the special features of the computer. The setup program uses a number of menus for making changes and turning the special features on or off.

#### 6.1.1. General Information

To start the BIOS setup utility press <DEL> when the string `Press <Del> to enter Setup` is displayed during bootup. The Main Menu will be displayed.

- **The Menu Bar**

The Menu Bar at the top of the window lists all the different menus. Use the up/down arrows to make a selection.

- **The Legend Bar**

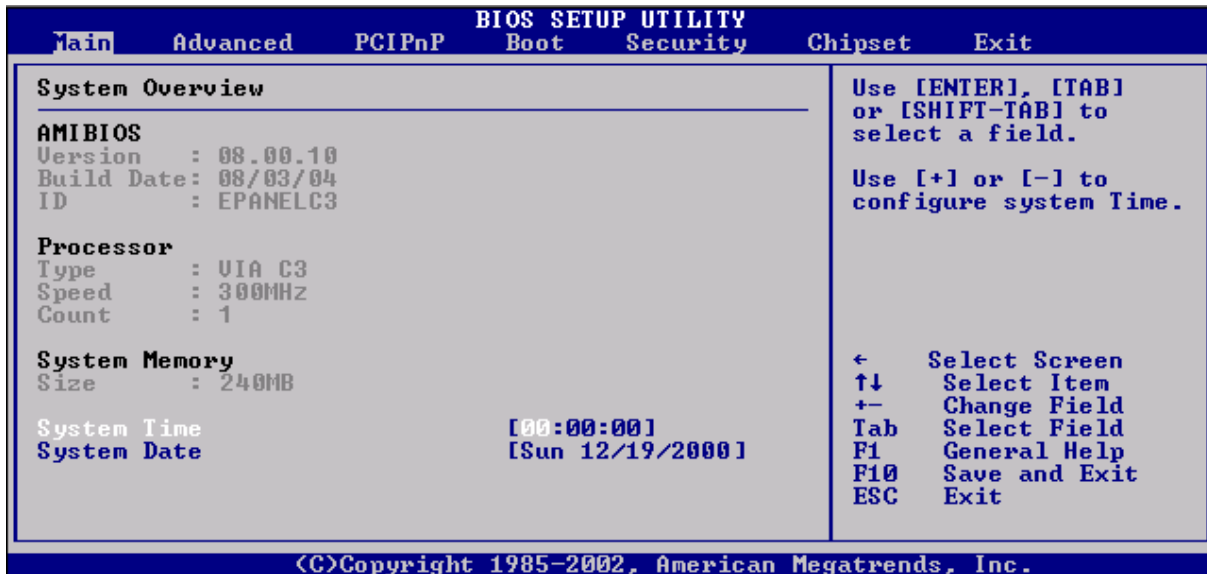
Use the keys listed in the legend bar on the bottom to make your selection or exit the current menu. The table below describes the legend keys and their alternates:

Key	Function
<Esc>	Exit this menu
↑ or ↓ Arrow key	Move cursor up and down
<Enter>	Execute command or select submenu

**To select an item**, simply use the arrow key to move the cursor to the field you want. Then use the Enter key to select a value for that field. The **Save Value and Exit** command in the Exit Menu save the values currently displayed in all the menus.

**To display a setup menu**, use the arrow keys to move the cursor to the sub menu you want. Then press <Enter>.

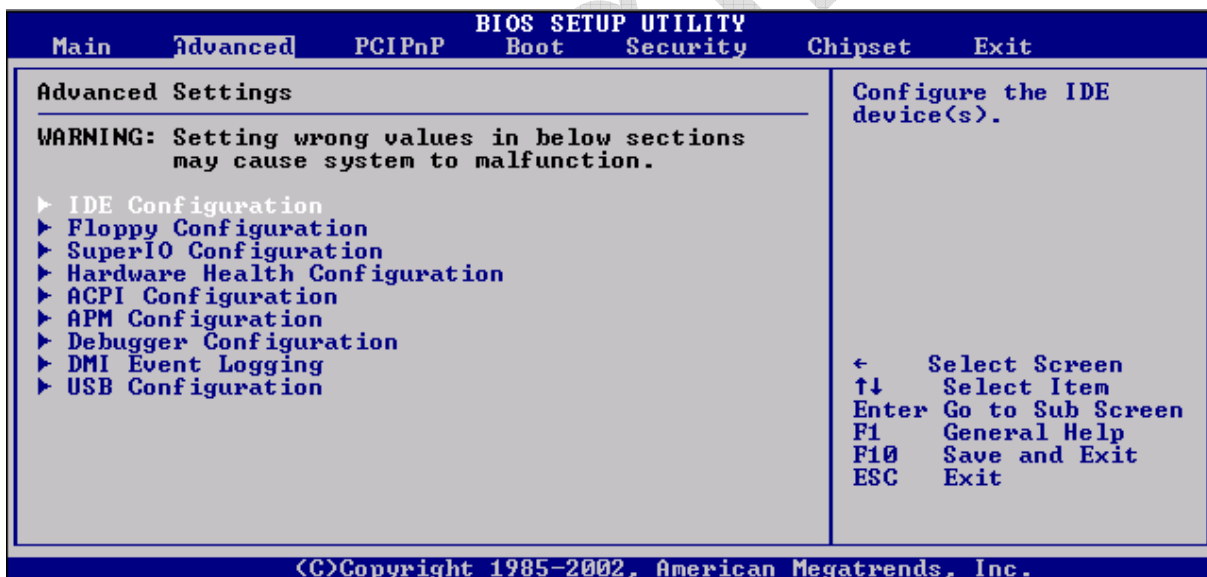
## 6.1.2. System Time/System Date



Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

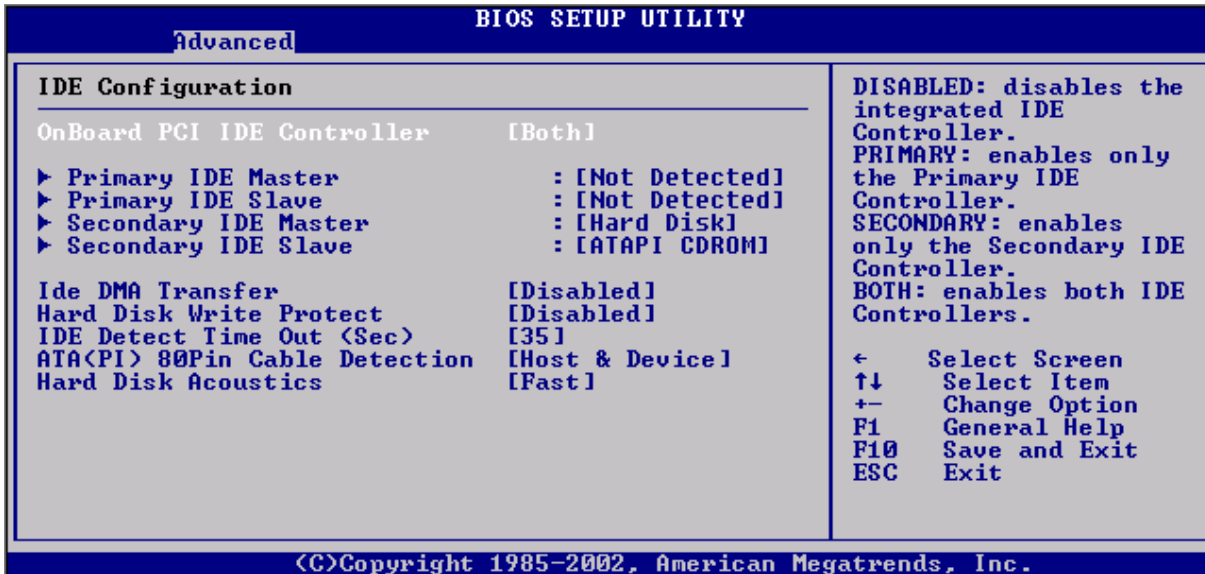
**Note:** The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

## 6.1.3. Advanced BIOS Setup



Select the Advanced tab from the setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as SuperIO Configuration, to go to the sub menu for that item.

## IDE CONFIGURATION SCREEN



From the IDE Configuration screen, press <Enter> to access the sub menu for the primary and secondary IDE master and slave drives.

### Primary and Secondary IDE Master and Slave Settings

From the IDE Configuration screen, press <Enter> to access the sub menu for the primary and secondary IDE master and slave drives. Use this screen to select options for the Primary and Secondary IDE drives.

Disable DMA transfer for IDE Drives.

IDE DMA Transfer

Enable write protection for drive.

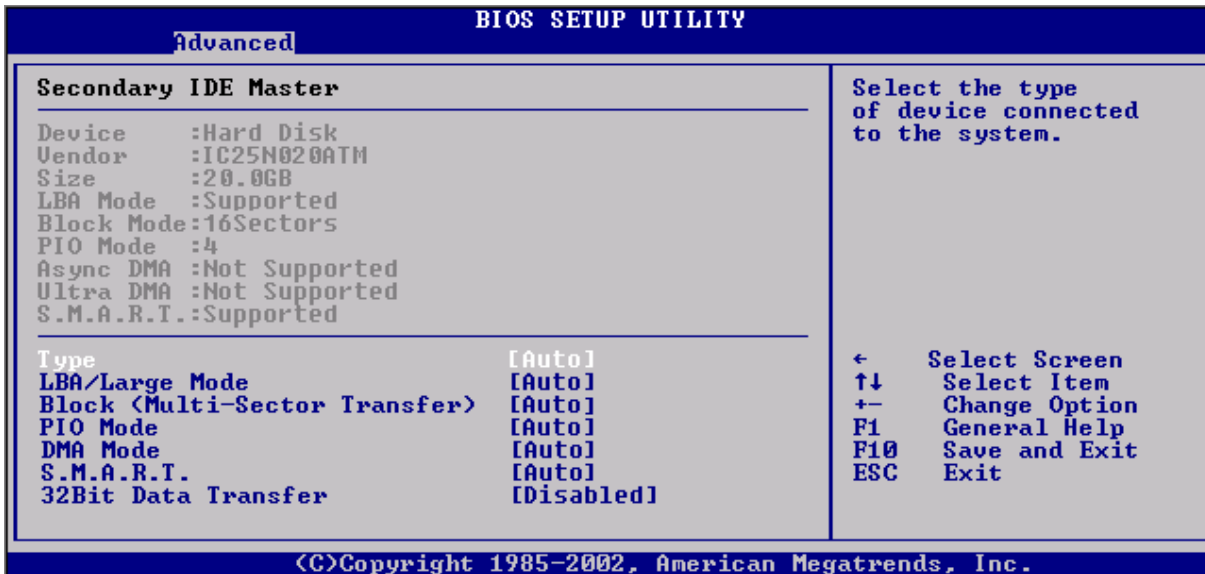
Hard Disk Write Protect

Timeout for IDE devices during POST.

IDE Detect time out

Hard disk Acoustics

## Configure drive mode



### Drive Parameters

The "grayed-out" items in the left frame are the IDE disk drive parameters taken from the firmware of the IDE disk drive selected.

### Type

This option sets the type of device that the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) has completed.

### LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

### Block (Multi-Sector Transfer)

This option sets the block mode multi sector transfers option.

### PIO Mode

IDE PIO (Programmable I/O) mode programs timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

### DMA Mode

This setting allows you to adjust the DMA mode options.

### S.M.A.R.T. for Hard disk drives

Self-Monitoring Analysis and Reporting Technology (SMART) feature can help predict impending drive failures.

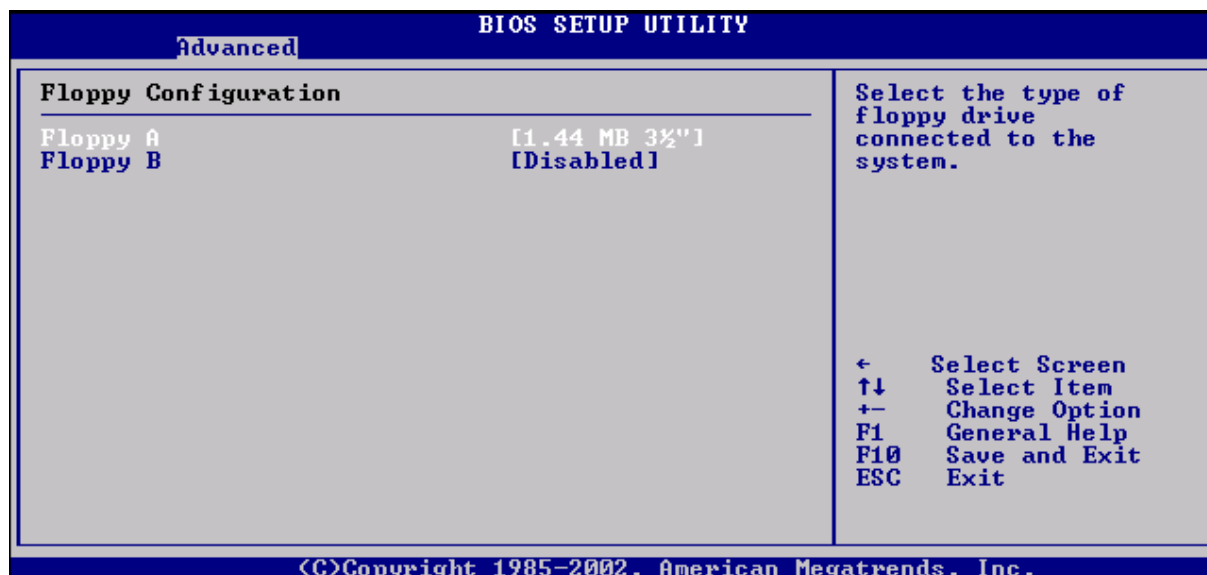
### 32Bit Data Transfer

This option sets the 32-bit data transfer option.

### ARMD Emulation Type

ATAPI Removable Media Device (ARMD) is a device that uses removable media, such as the LS120, MO (Magneto-Optical), or Iomega Zip drives. If you want to boot up from media on an ARMD, it is required that you emulate boot up from a floppy or hard disk drive. This is especially necessary when trying to boot to DOS. You can select the type of emulation used if you are booting from such a device.

## Floppy Configuration Settings

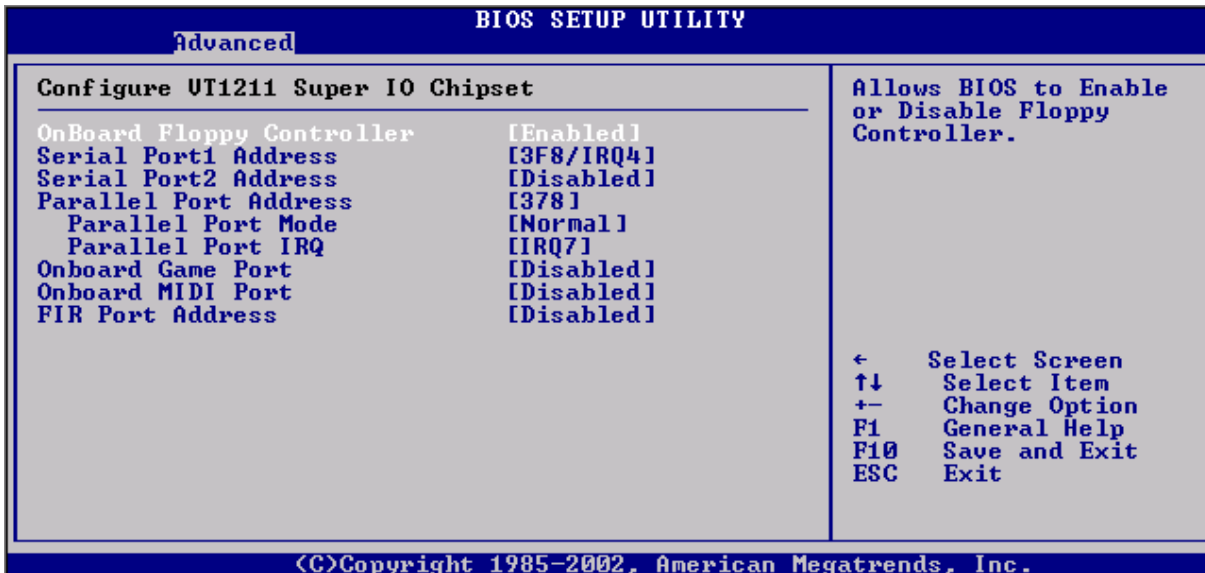


You can use this screen to specify options for the Floppy Configuration Settings. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option as described.

### Floppy Drive A: and B:

Move the cursor to these fields via up and down <arrow> keys. Select the floppy type.

## SUPER I/O CONFIGURATION SCREEN



### Super I/O Configuration Screen

You can use this screen to select options for the Super I/O settings.

#### Serial Port1 Address

This option specifies the base I/O port address and Interrupt Request address of serial port 1.

#### Serial Port2 Address

This option specifies the base I/O port address and Interrupt Request address of serial port 2

#### Onboard FIR Port

This option specifies the base I/O port address of the onboard FIR port.

#### Parallel Port Address

This option specifies the I/O address used by the parallel port.

#### Parallel Port Mode

This option specifies the parallel port mode. The Optimal setting is *Normal*. The Fail-Safe setting is *Disabled*.

#### Parallel Port IRQ

This option specifies the IRQ used by the parallel port.

#### OnBoard Game/Midi Port

This option specifies the onboard Game/Midi port I/O address.

### Hardware Health Screen



### Enable Thermal monitoring

Enable temperature monitoring of the CPU.

Threshold temperature to turn on active cooling ( fan ).

>>> **Active threshold**

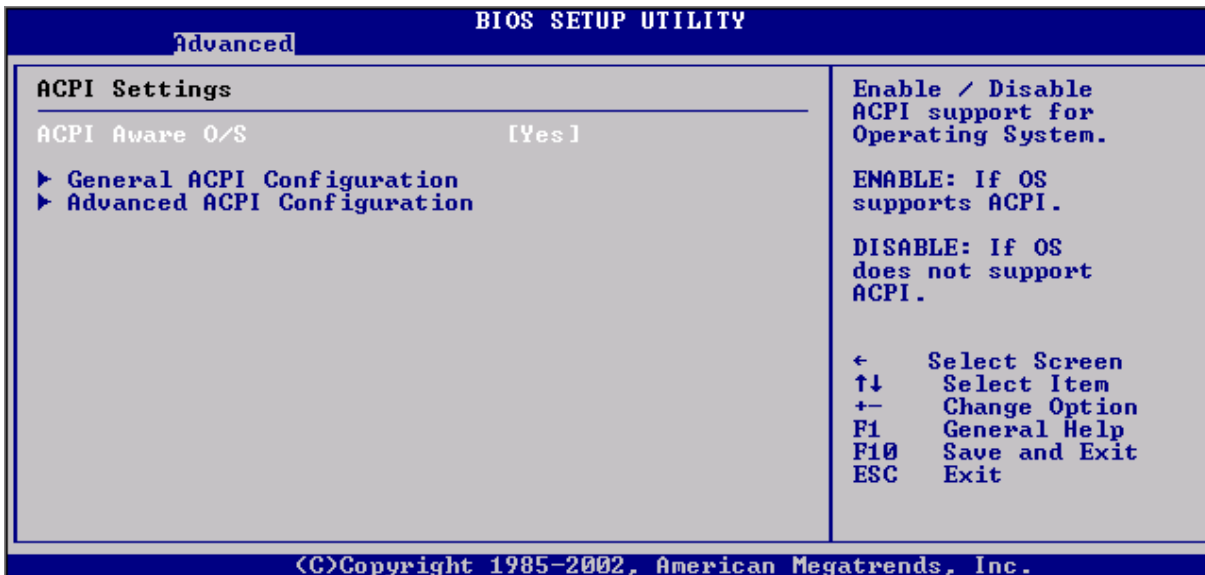
Threshold temperature to turn on passive cooling by throttling the CPU

>>> **Passive threshold**

Threshold temperature shutdown the system

>>> **Critical threshold**

### ACPI Setup

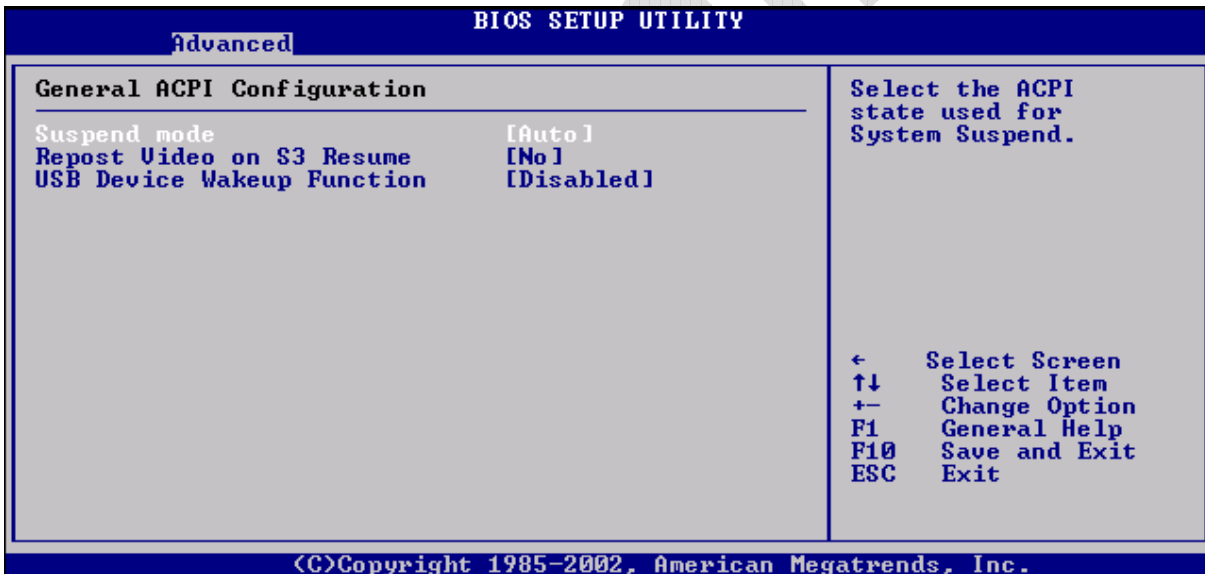


### ACPI Aware O/S

Set this value to allow the system to utilize the Intel ACPI (Advanced Configuration and Power Interface) specification.

### ACPI General Configuration

You can use this screen to select options for the ACPI Advanced Configuration Settings.

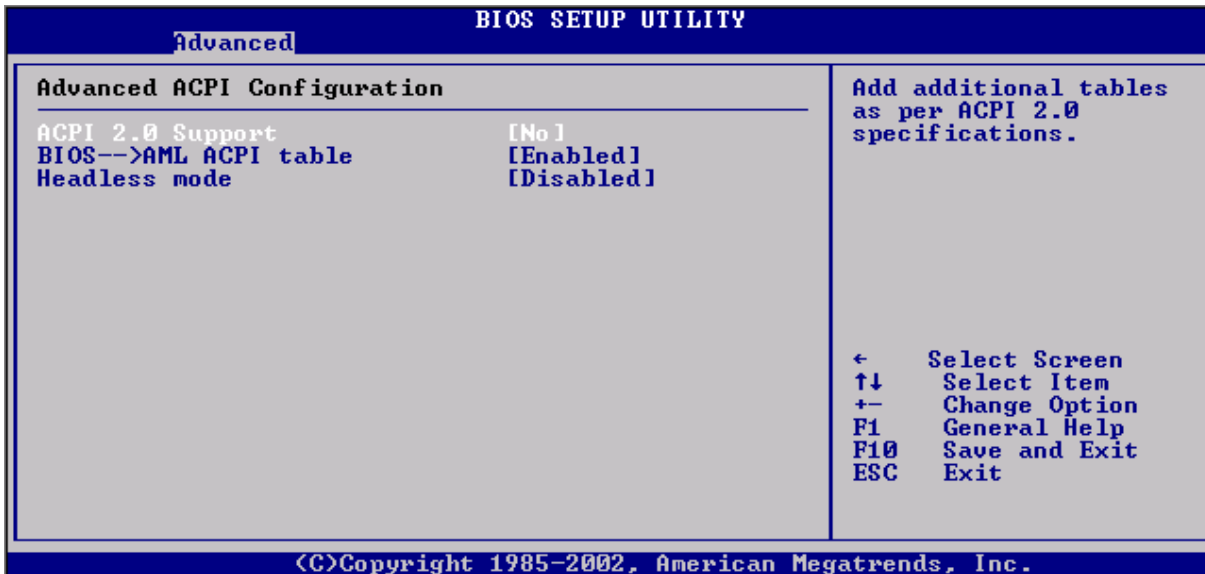


### Repost Video on S3 Resume

Set this value to allow video repost support.

### ACPI Advanced Configuration

You can use this screen to select options for the ACPI Advanced Configuration Settings.



### ACPI 2.0

Set this value to allow or prevent the system to be compliant with the ACPI 2.0 specification.

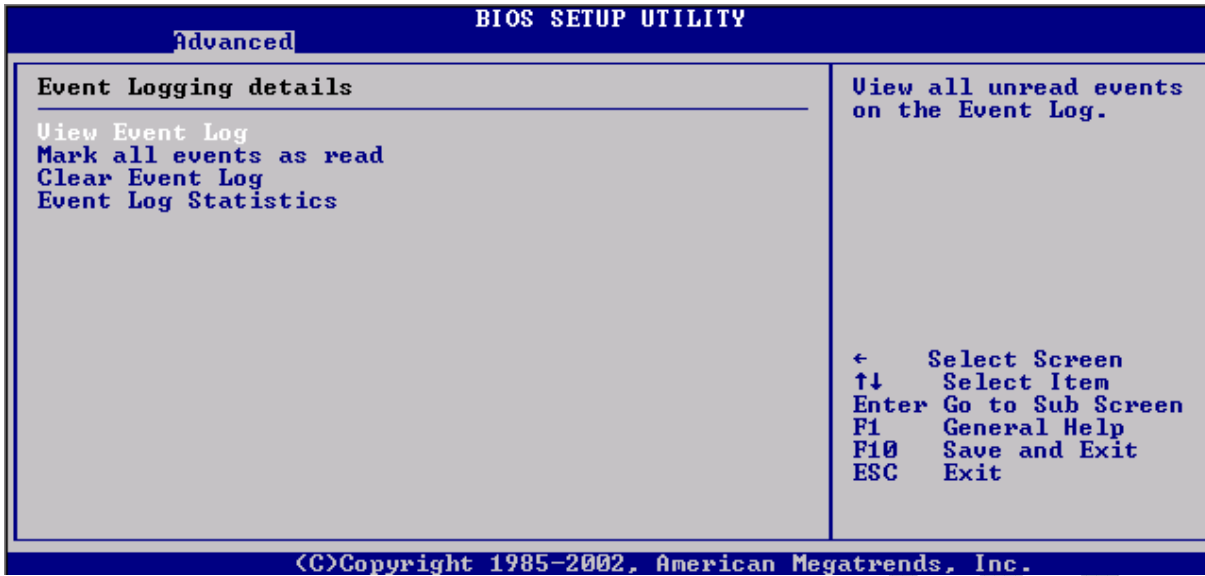
### BIOS-> AML ACPI Table

Set this value to allow the ACPI BIOS to add a pointer to an OEMB table in the Root System Description Table (RSDT) table.

### Headless Mode

This option is used to update the ACPI FACP table to indicate headless operations.

## Event logging setup



### View Event log

This option is used view all logged events

### Mark all events as read

This option is used to mark all current events as read in the event log.

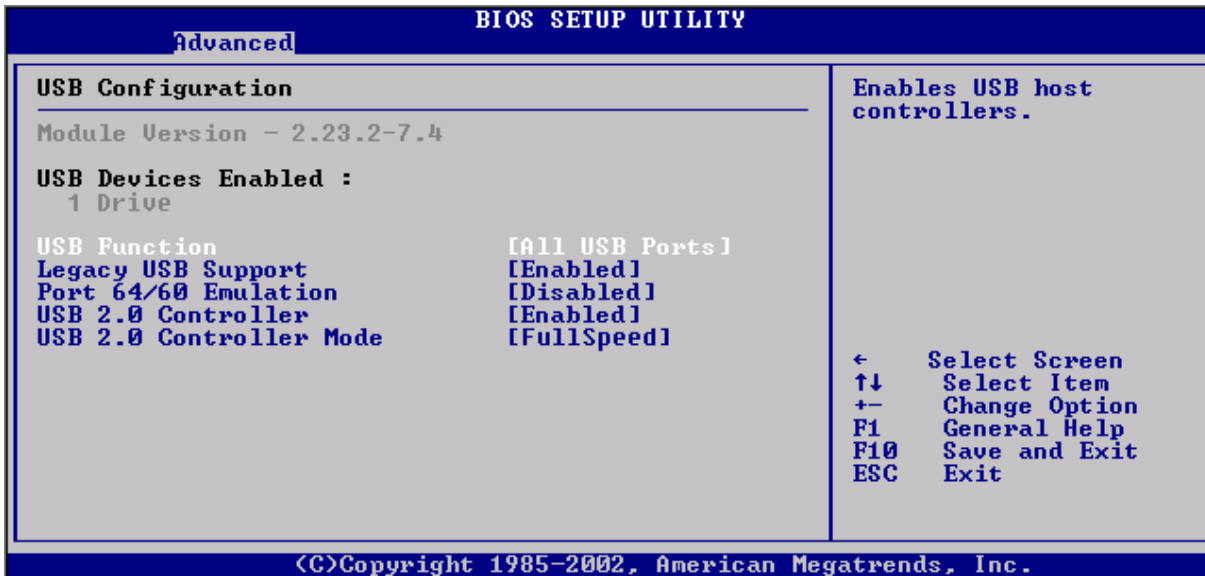
### Clear Event log

This option is used to clear the whole event log.

### Event log statistics

View current event log statistics.

## USB CONFIGURATION



### USB Configuration

You can use this screen to select options for the USB Configuration.

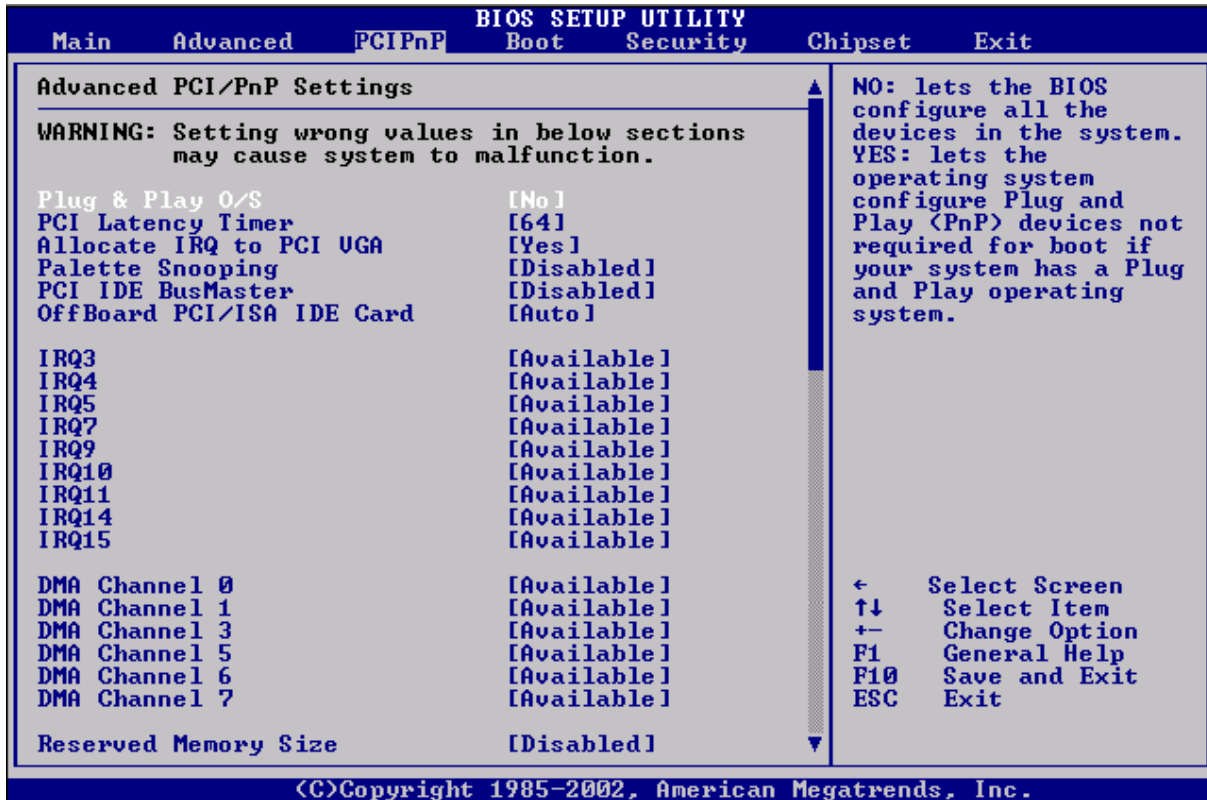
### USB Function

Set this value to allow the system to enable or disable the onboard USB ports.

### Legacy USB Support

Legacy USB Support refers to the USB mouse and USB keyboard support. Normally if this option is not enabled, any attached USB mouse or USB keyboard will not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB drivers loaded on the system. Set this value to enable or disable the Legacy USB Support.

## PCI/PnP Setup



Select the *PCI/PnP* tab from the setup screen to enter the Plug and Play BIOS Setup screen.

### Plug and Play O/S

Set this value to allow the system to modify the settings for Plug and Play operating system support.

### Reset Configuration Data

Set this value to allow the BIOS to reset the Configuration Data in the BIOS.

### PCI Latency Timer

Set this value to allow the PCI Latency Timer to be adjusted. This option sets the latency of all PCI devices on the PCI bus.

### Allocate IRQ to VGA

Set this value to allow or restrict the system from giving the VGA adapter card an interrupt address.

### Palette Snooping

Set this value to allow the system to modify the Palette Snooping settings.

### PCI IDE BusMaster

Set this value to allow or prevent the use of PCI IDE busmastering.

### OffBoard PCI/ISA IDE Card

Set this value to allow the OffBoard PCI/ISA IDE Card to be selected.

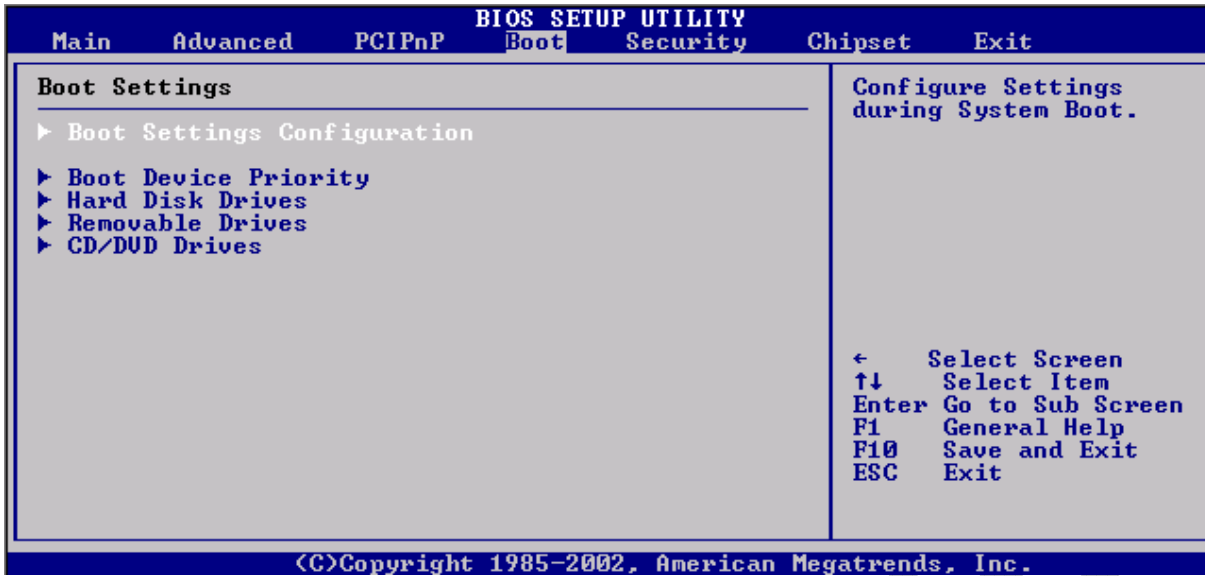
### IRQ

Set this value to allow the IRQ settings to be modified.

### DMA

Set this value to allow the DMA setting to be modified.

## Boot Setup



Select the *Boot* tab from the setup screen to enter the Boot BIOS Setup screen. You can select any of the items in the left frame of the screen, such as Boot Device Priority, to go to the sub menu for that item. You can display a Boot BIOS Setup option by highlighting it using the <Arrow> keys. All Boot Setup options are described in this section. Select an item on the Boot Setup screen to access the sub menu for:

- Boot Device Priority
- Hard disk drives
- Removable Devices
- ATAPI CD-ROM Drives

### Boot Settings Configuration

Use this screen to select options for the Boot Settings Configuration.

### Boot Device Priority

Use this screen to specify the order in which the system checks for the device to boot from.

### Hard disk drives

Use this screen to view the hard disk drives in the system.

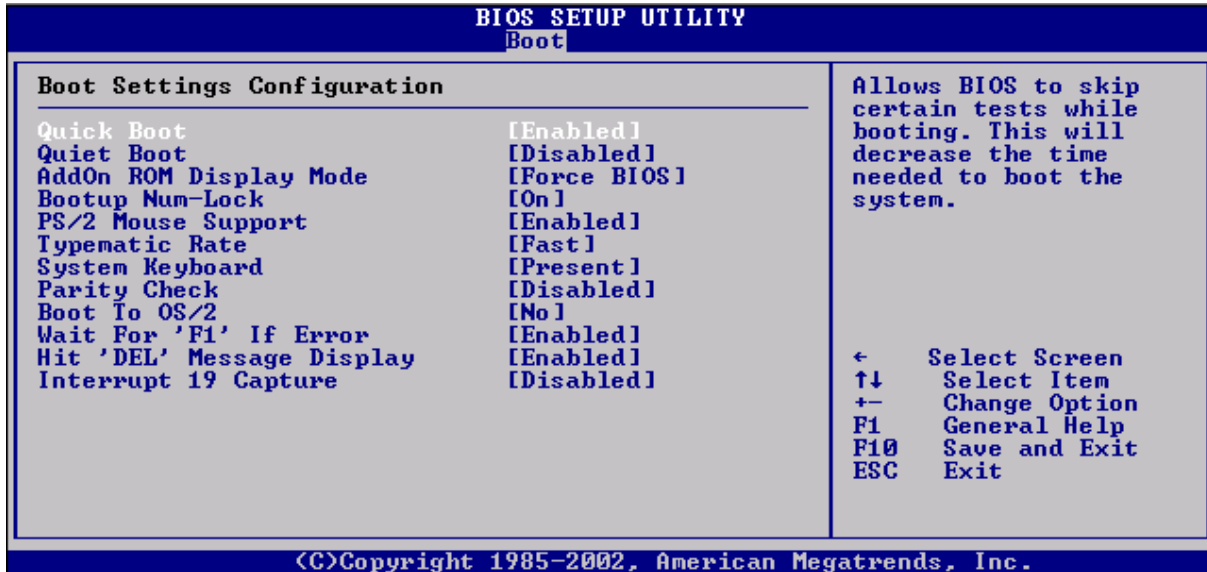
### Removable Devices

Use this screen to view the removable drives attached to the system.

### ATAPI CD-ROM Drives

Use this screen to view the ATAPI CD-ROM drives in the system.

## Boot Settings Configuration



Use this screen to select options for the Boot Settings Configuration. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. The settings are described on the following pages

### Quick Boot

**Disabled** Set this value to allow the BIOS to perform all POST tests. **Enabled** Set this value to allow the BIOS to skip certain POST tests to boot faster.

### Quiet Boot

**Disabled** Set this value to allow the computer system to display the POST messages. **Enabled** Set this value to allow the computer system to display the OEM logo. This is the default setting.

### Add-On ROM Display Mode

**Force BIOS** Set this value to allow the computer system to force a third party BIOS to display during system boot. This is the default setting. **Keep Current** Set this value to allow the computer system to display the ezPORT information during system boot.

### Boot up Num-Lock

**Off** This option does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard will light up when the Number Lock is engaged. **On** Set this value to allow the Number Lock on the keyboard to be enabled automatically when the computer system is boot up. This allows the immediate use of 10-keys numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard will be lit. This is the default setting.

### PS/2 Mouse Support

**Disabled** This option will prevent the PS/2 mouse port from using system resources and will prevent the port from being active. Use this setting if installing a serial mouse. **Enabled** Set this value to allow the system to use a PS/2 mouse. This is the default setting.

### Typematic Rate

**Slow** This option sets the rate the computer repeats a key to under 8 times per second. **Fast** This option sets the rate the computer repeats a key to over 20 times per second. This is the default setting. Under normal operations, this setting should not be changed.

### System Keyboard

**Absent** Set this value to prevent the computer system from using a keyboard. Use this option if there is no keyboard attached to the computer system. **Present** Set this value to allow the use of a keyboard with the computer system. This is the default setting and should not be changed under normal use.

### Boot to OS/2

**No** This allows the computer system to boot up into non-OS/2 environments. This is the default setting and should not be changed unless OS/2 is the main operating system and more than 64 MB of system memory is installed. **Yes** This allows the computer system to boot up to an OS/2 environment when more than 64 MB of system memory is installed.

## Wait for 'F1' If Error

**Disabled** This prevents the ezPORT to wait on an error for user intervention. This setting should be used if there is a known reason for a BIOS error to appear. An example would be a system administrator must remote boot the system. The computer system does not have a keyboard currently attached. If this setting is set, the system will continue to boot up in to the operating system. If 'F1' is enabled, the system will wait until the BIOS setup is entered. **Enabled** Set this value to allow the system BIOS to wait for any error. If an error is detected, pressing <F1> will enter Setup and the BIOS setting can be adjusted to fix the problem. This normally happens when upgrading the hardware and not setting the BIOS to recognize it. This is the default setting.

## Hit 'DEL' Message Display

**Disabled** This prevents the ezPORT to display Hit Del to enter Setup during memory initialization. If Quiet Boot is enabled, the Hit 'DEL' message will not display. **Enabled** This allows the ezPORT to display Hit Del to enter Setup during memory initialization. This is the default setting.

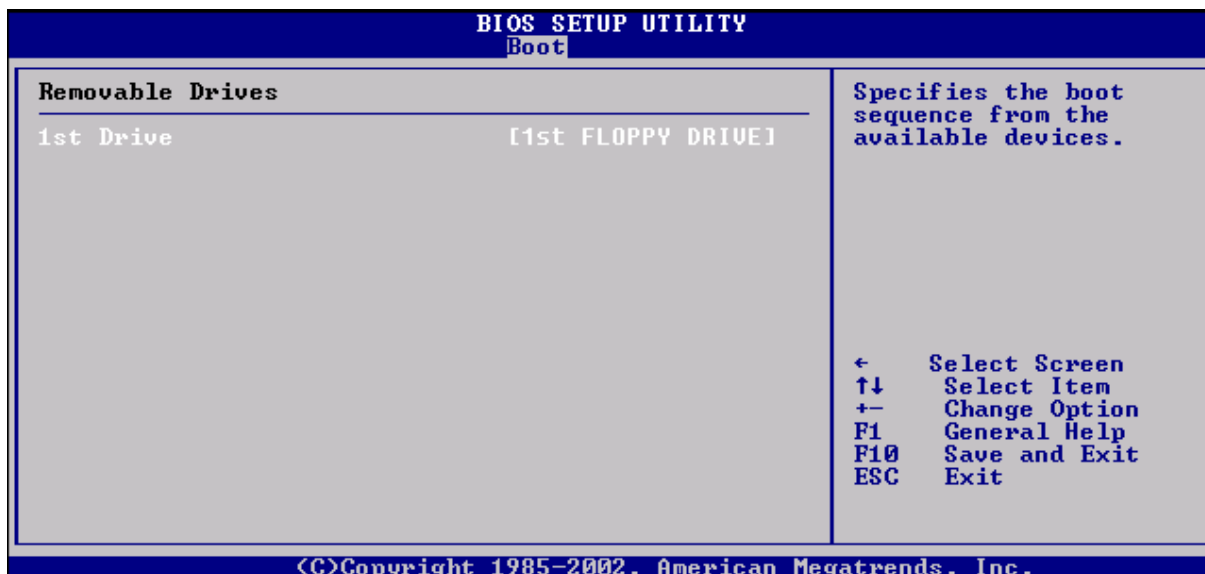
**Boot Device Priority** Use this screen to specify the order in which the system checks for the device to boot from.

BIOS SETUP UTILITY	
Boot	
<b>Boot Device Priority</b>	Specifies the boot sequence from the available devices.
1st Boot Device [1st FLOPPY DRIVE]	A device enclosed in parenthesis has been disabled in the corresponding type menu.
2nd Boot Device [CD/DUD:SS-CDU5211]	
3rd Boot Device [HDD:SM-IC25N020ATM]	
	← Select Screen ↑↓ Select Item +- Change Option F1 General Help F10 Save and Exit ESC Exit
<C>Copyright 1985-2002, American Megatrends, Inc.	

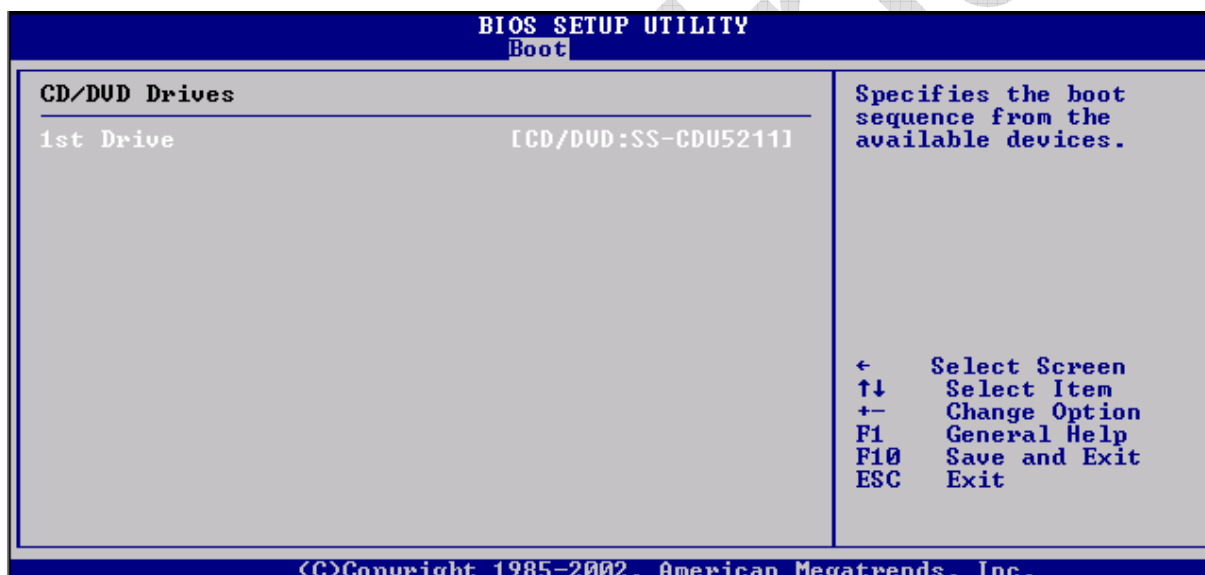
**Hard disk drives** Use this screen to view the hard disk drives in the system.

BIOS SETUP UTILITY	
Boot	
<b>Hard Disk Drives</b>	Specifies the boot sequence from the available devices.
1st Drive [HDD:SM-IC25N020ATM]	
	← Select Screen ↑↓ Select Item +- Change Option F1 General Help F10 Save and Exit ESC Exit
<C>Copyright 1985-2002, American Megatrends, Inc.	

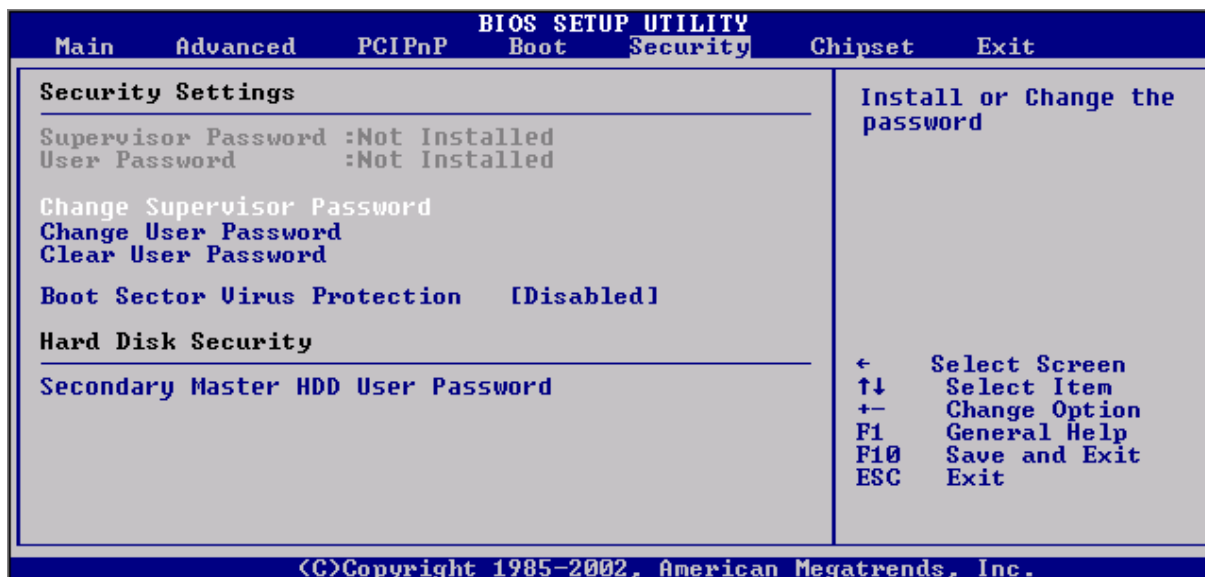
**Removable Devices** Use this screen to view the removable drives attached to the system.



**ATAPI CD-ROM Drives** Use this screen to view the ATAPI CD-ROM drives in the system.



## Security Setup



### Two Levels of Password Protection

The setup provides both a Supervisor and a User password. If you use both passwords, the Supervisor password must be set first. The system can be configured so that all users must enter a password every time the system boots or when Setup is executed, using either or either the Supervisor password or User password. The Supervisor and User passwords activate two different levels of password security. If you select password support, you are prompted for a one to six character password. Type the password on the keyboard. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must drain NVRAM and reconfigure.

### Supervisor Password

Indicates whether a supervisor password has been set. If the password has been installed, *Installed* displays. If not, *Not Installed* displays.

### User Password

Indicates whether a user password has been set. If the password has been installed, *Installed* displays. If not, *Not Installed* displays.

### Change Supervisor Password

Select this option and press <Enter> to access the sub menu. You can use the sub menu to change the supervisor password.

### Change User Password

Select this option and press <Enter> to access the sub menu. You can use the sub menu to change the user password.

### Clear User Password

Select this option and press <Enter> to access the sub menu. You can use the sub menu to clear the user password.

### Change Supervisor Password

Select Change Supervisor Password from the Security Setup menu and press <Enter>.

Enter New Password: appears. Type the password and press <Enter>. The screen does not display the characters entered. Retype the password as prompted and press <Enter>. If the password confirmation is incorrect, an error message appears. The password is stored in NVRAM after the setup completes.

### Change User Password

Select Change User Password from the Security Setup menu and press <Enter>. Enter New Password: appears.

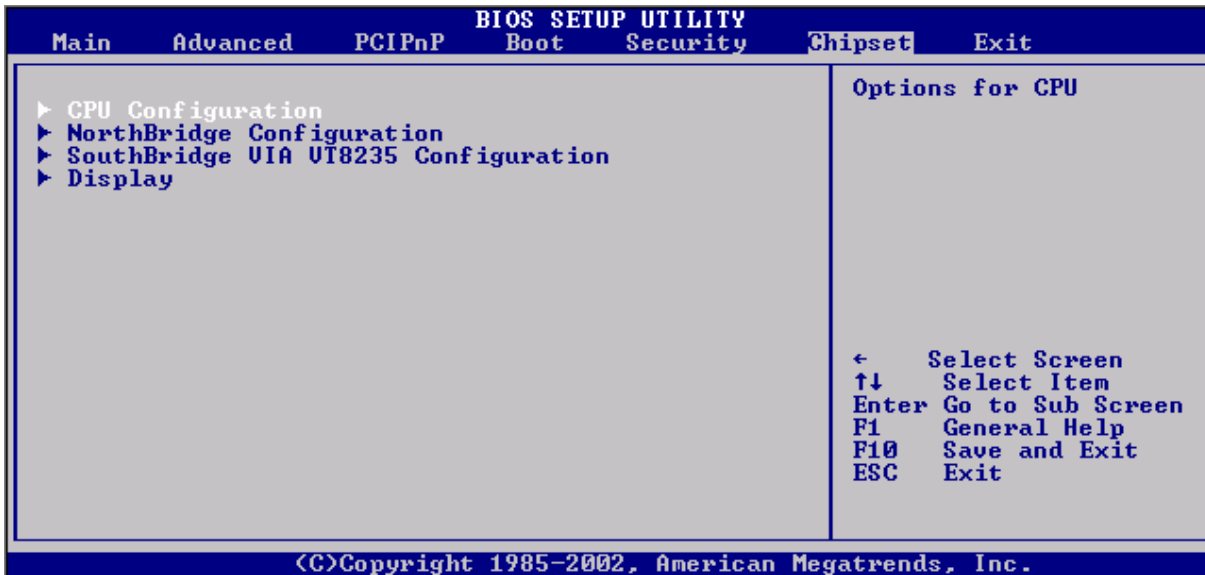
Type the password and press <Enter>. The screen does not display the characters entered. Retype the password as prompted and press <Enter>. If the password confirmation is incorrect, an error message appears. The password is stored in NVRAM after the setup completes.

---

## Clear User Password

Select Clear User Password from the Security Setup menu and press <Enter>. Clear New Password [Ok] [Cancel] appears. Type the password and press <Enter>. The screen does not display the characters entered. Retype the password as prompted and press <Enter>. If the password confirmation is incorrect, an error message appears. The password is stored in NVRAM after setup completes.

Preliminary



### CPU Configuration

You can use this screen to select options for the CPU Configuration.

### North Bridge Configuration

You can use this screen to select options for the North Bridge Configuration.

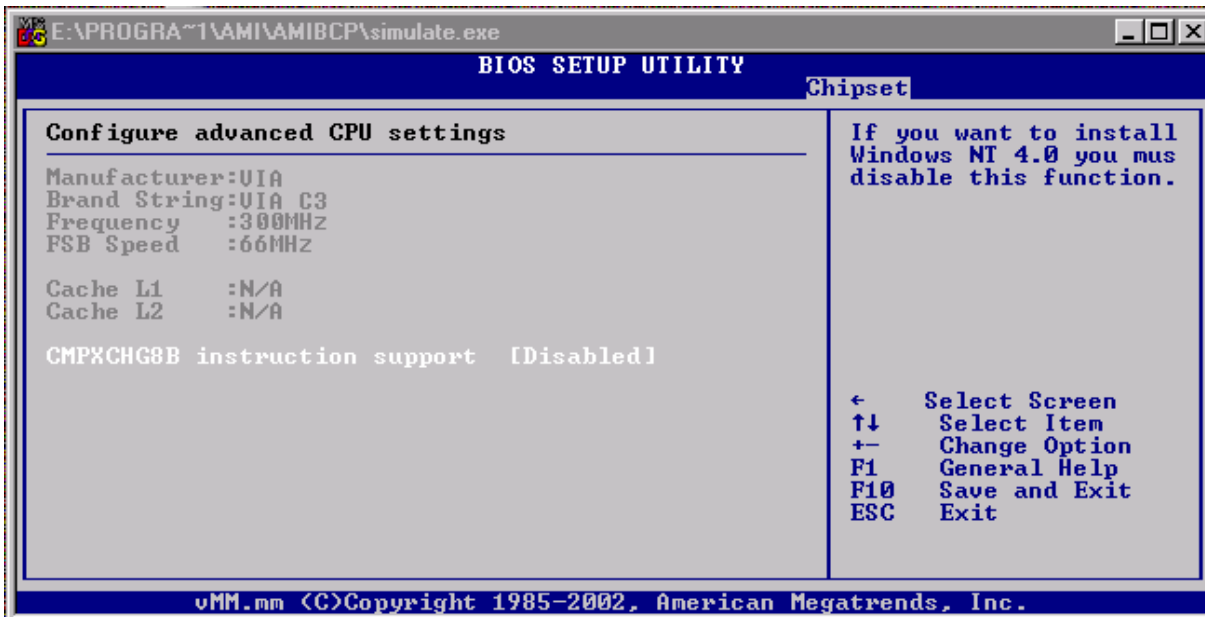
### South Bridge Configuration

You can use this screen to select options for the South Bridge Configuration.

### Display

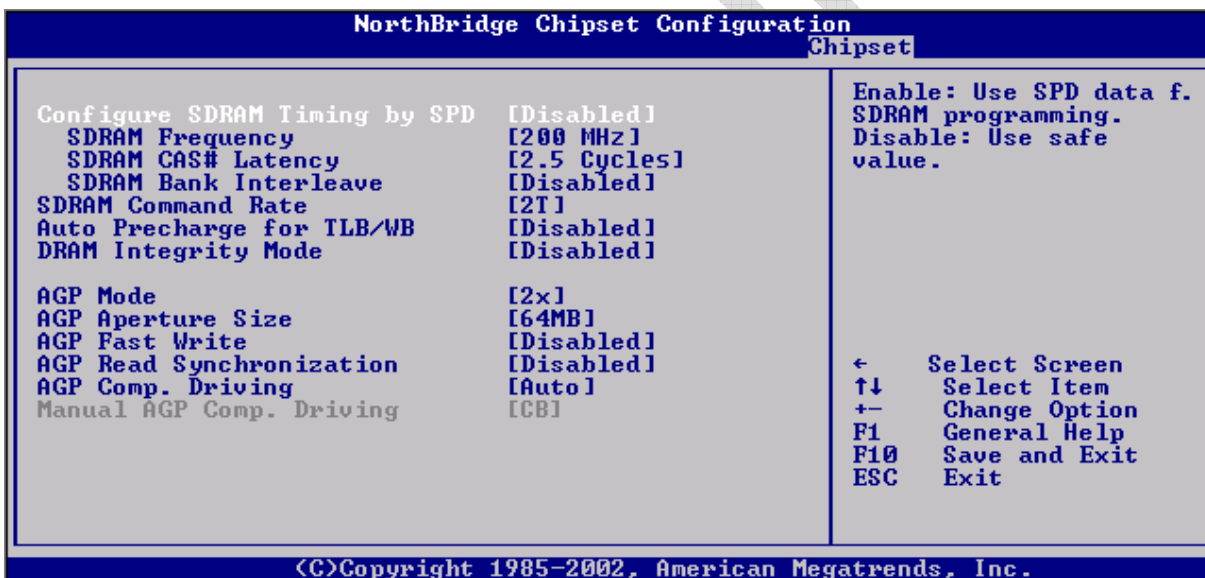
You can use this screen to select options for the Display devices.

## CPU Configuration



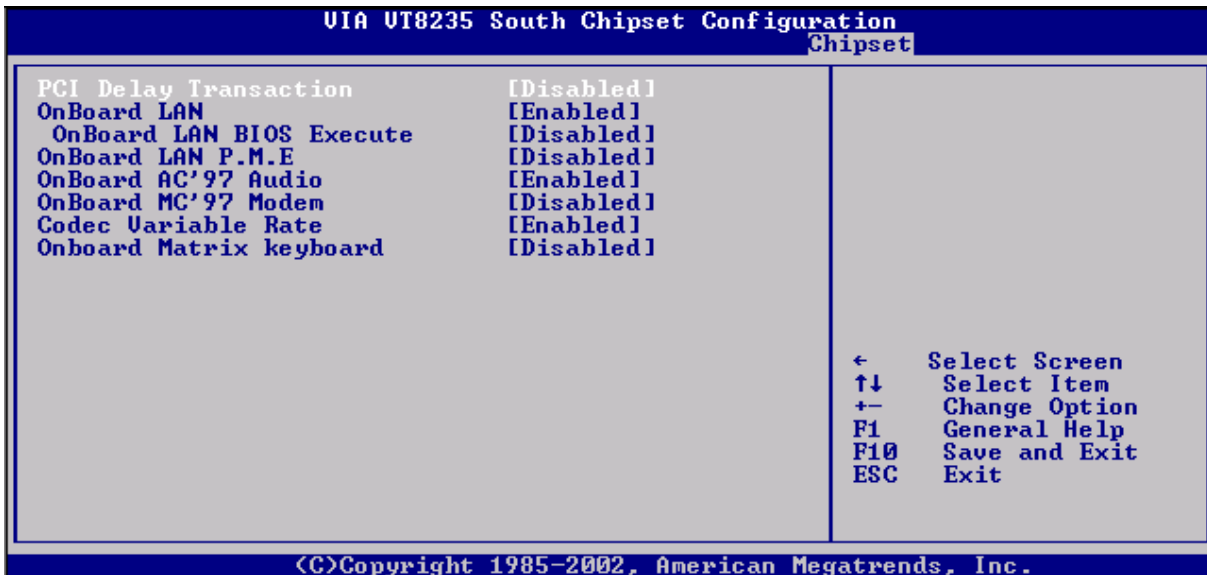
You can use this screen to select options for the CPU Configuration.

### North Bridge Configuration



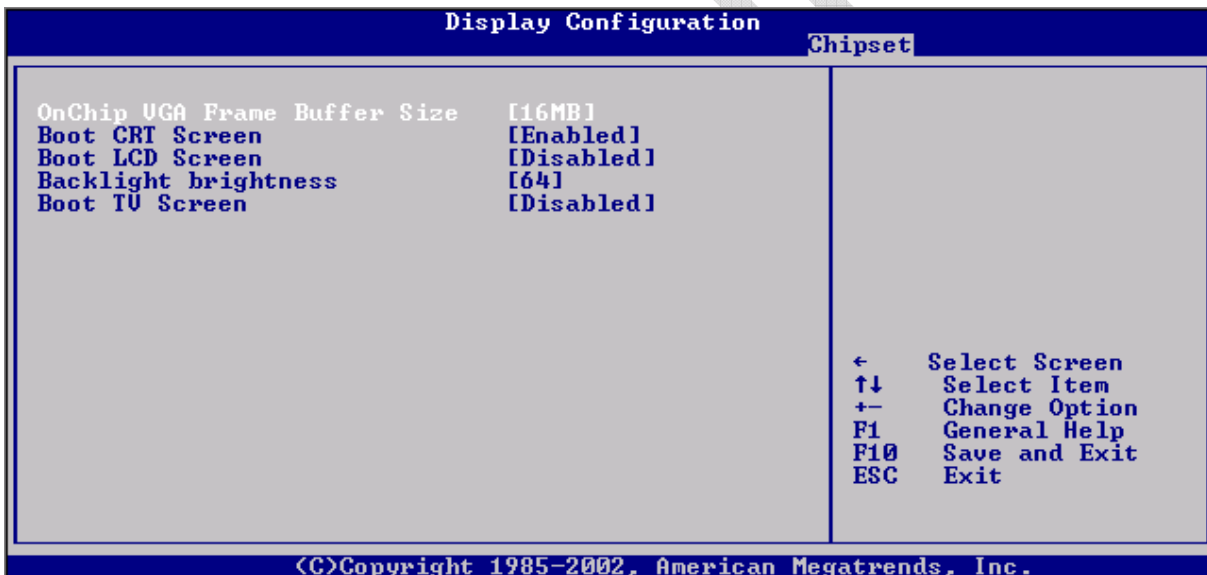
You can use this screen to select options for the North Bridge Configuration.

### South Bridge Configuration



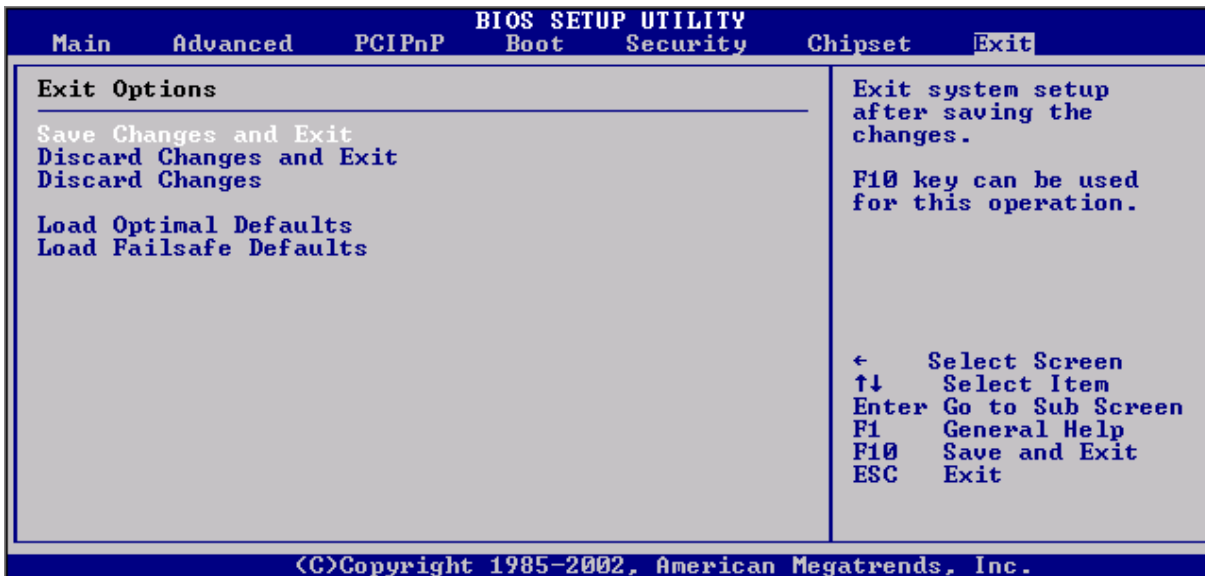
You can use this screen to select options for the South Bridge Configuration. South Bridge is a chipset on the motherboard that controls the basic I/O functions, USB ports, audio functions, modem functions, IDE channels, and PCI slots.

## Display Configuration



You can use this screen to select options for the display Configuration. Output devices are enabled here and connected LCD Panel configured.

## Exit Menu



### Exit Saving Changes

When you have completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configuration parameters can take effect. Select Exit Saving Changes from the Exit menu and press <Enter>. Save Configuration Changes and Exit Now? [Ok] [Cancel] appears in the window. Select Ok to save changes and exit.

### Exit Discarding Changes

Select this option to quit ezPORT Setup without making any permanent changes to the system configuration. Select Exit Discarding Changes from the Exit menu and press <Enter>. Discard Changes and Exit Setup Now? [Ok] [Cancel] appears in the window. Select Ok to discard changes and exit.

### Load Optimal Defaults

The setup automatically sets all Setup options to a complete set of default settings when you Select this option. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Optimal Setup options if your computer is experiencing system configuration problems. Select Load Optimal Defaults from the Exit menu and press <Enter>. Select Ok to load optimal defaults.

### Load Fail-Safe Defaults

The Setup automatically sets all Setup options to a complete set of default settings when you Select this option. The Fail-Safe settings are designed for maximum system stability, but not maximum performance. Select the fail-Safe ezPORT Setup options if your computer is experiencing system configuration problems. Select Load Fail-Safe Defaults from the Exit menu and press <Enter>. Load Fail-Safe Defaults? [Ok] [Cancel] appears in the window. Select Ok to load Fail-Safe defaults.

### Discard Changes

Select Discard Changes from the Exit menu and press <Enter>. Select Ok to discard changes.

## 6.2. BIOS Update

TBD.

## 7. HARDWARE DESCRIPTION

### VIA Eden™ ESP processor family

The **ePanel-C3** Board operates with the VIA Eden™ ESP processor family .

The VIA Eden™ Platform is a low power, high performance, and highly integrated x86 platform that provides the most flexible, compatible, and cost-effective solution for building the emerging new generation of connected digital information & entertainment devices. It combines a proven ultra low power sixth generation processor core with a choice of a variety of highly integrated North Bridge and South Bridge chips, as well as a broad spectrum of expansion options for enhanced communications, connectivity, and multimedia functions.

The VIA Eden™ Embedded System Platform Processor (VIA Eden ESP for short) is based upon a unique internal architecture and is manufactured using advanced 0.15μ / 0.13μ CMOS technology. The VIA Eden ESP architecture and companion chips provide a highly compatible, high-performance, low-cost, and low-power solution for the embedded, mini-notebook, embedded, and Internet Appliance markets. The VIA Eden ESP is available in several operating frequencies.

The VIA Eden ESP processor is initially available on ePanel-C3 in following variety of models:

- VIA Eden ESP 3000 (4.5 x 66-MHz bus)
- VIA Eden ESP 7000 (5.5 x 133-MHz bus)
- VIA Eden ESP 10000 (7.5 x 133-MHz bus)

<i>Feature</i>	<i>Benefits</i>
<b>Fanless operation</b>	Ultra reliable, silent and low power
<b>Highly efficient CoolStream architecture</b>	Increased performance and ultra low power consumption
<b>Clock speeds of 733MHz and beyond</b>	Superior digital media and productivity application performance
<b>16 Pipeline Stages</b>	Faster CPU speed and efficiency
<b>StepAhead Advanced Branch Prediction</b>	Looks ahead and gathers the data needed to optimally run applications
<b>Efficiency enhanced 64KB Full-Speed Exclusive L2 cache with 16-way associativity</b>	Greater memory optimization for enhanced digital media streaming and over all performance
<b>SSE Instructions</b>	Enhanced 3D and multimedia performance
<b>Full Speed FPU</b>	Additional processing power for 3D graphics, multimedia, and streaming functions
<b>Industry leading 0.13 micron manufacturing process</b>	Minimizes power consumption and heat generation while allowing smaller, lighter processor coolers and maximizing total system power efficiency
<b>Ultra low power consumption</b>	Industry leading max power consumption of a mere 6 watts at 733MHz
<b>Ultra low heat</b>	Requires less cooling and less space
<b>PadLock Data Encryption Engine</b>	Power efficient on-die Hardware Random Number Generator (RNG)
<b>EBGA package</b>	Lower profile, higher speed, greater efficiency, better heat dissipation, requires less system real estate
<b>Full x86 Operating System &amp; software application compatibility</b>	Leverages the richest and most cost-effective software development platforms, including Microsoft® Windows® and Linux

*Feature and benefit chart for VIA EDEN ESP7000*

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## North Bridge :

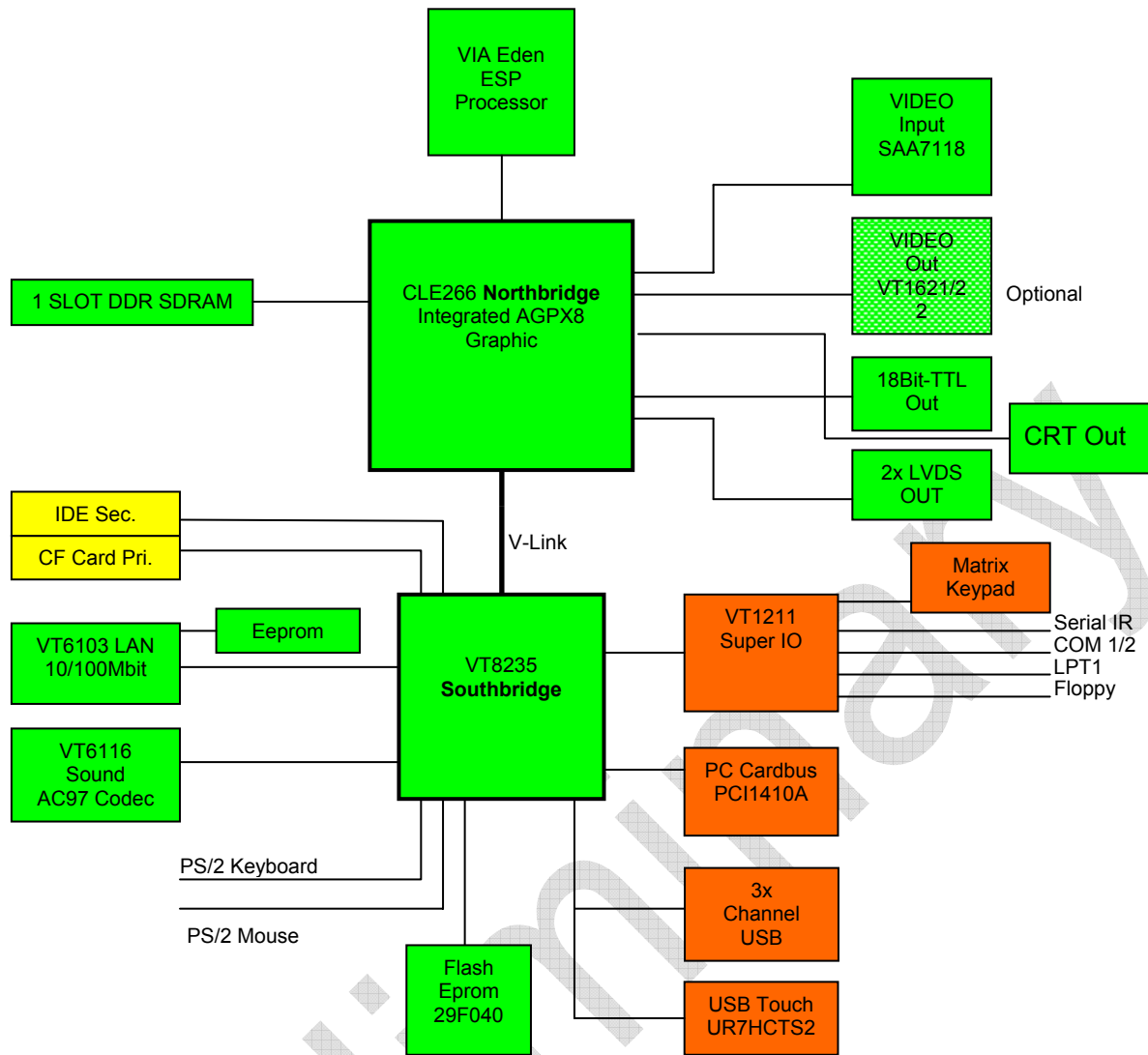
### **Market-leading x86 North Bridge technology featuring:**

- Integrated MPEG-2 Hardware Acceleration and Motion Compensation
- Advanced high performance DDR 266 SDRAM memory controller with support for up to 1GB of memory
- Dual View support
- Two video stream with on-the-fly Alpha Blending
- Integrated low power AGP 8X equivalent graphics with high performance 3D acceleration, and full 2D/video acceleration including motion compensation and up to 64MB Frame Buffer
- CRT/TFT Flat Panel Support ( TTL and LVDS )
- High bandwidth V-Link Host Controller
- Advance System Power Management

## South Bridge

### **Proven x86 South Bridge technology with highly integrated multimedia, communications, and connectivity features, including:**

- AC 97 audio
- USB 2.0
- Super I/O
- ATA-33/66/100/133 support
- 10/100 Mbps Ethernet



## Audio

### VT1616

- AC'97 Codec
- 2 Line Level Inputs
- 2 Line Level Outputs
- S/PDIF Output

## Video

### Optional VT1622AM

- NTSC / PAL system
- CVBS, S-Video, Component
- Up to 1024x768

## Super IO

### VT1211

- Super I/O
- Hardware Monitoring

## LAN

### VT6103

- 10/100 Base-T LAN

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## **7.1. Memory configuration**

The **ePanel-C3** uses only DDR-RAM (SO-DIMMs). One socket is available for 3.3 Volt (power level) unbuffered Synchronous Double Data Rate (DDR), Small Outline Dual In-Line Memory Module (DDR SDRAM SO-DIMMs). Specification of the PC2100 Module is using 133 MHz clock (266 MT/s data rate) of either 64 Mb, 128 MB, 256 MB, 512 MB, 1 GB.

## **7.2. Watchdog**

TBD ( Not supported yet ).

## **7.3. Compact Flash Socket (True IDE compatible)**

A compact flash socket for commercial CF cards (Type I+II) is already integrated on the module. This socket can serve as boot drive and is not hot-pluggable.

## **7.4. Ethernet 10BASE-T/100BASE-TX LAN**

The Ethernet controller is a physical Layer device for 10Base-t and 100Base-TX using category 5 Unshielded and 1 Type shielded cables. Autonegotiation for :

- Dual Speed - 10 / 100Mbps
- Half and Full Duplex

Meets IEEE 802.3 10 Base-T and 100 Base-TX Standards

## **7.5. Smart battery charger**

The Smart Battery Charger is a charging circuit that provides the Smart Battery with charging current and charging voltage to match the Smart Battery's requested requirements. This allows the battery to control its own charge cycle, thus providing a chemistry independent interface to the battery system. Optionally, the Smart Battery Charger may not allow the Smart Battery to supply power to the rest of the system when the Smart Battery is fully charged and the system is connected to AC power thus prolonging the life of the battery. The Smart Battery Charger will also receive critical events from the Smart Battery when it detects a problem. These include alarms for charging conditions or temperature conditions which exceed the limits set within the particular Smart Battery. Charging of the battery is independent of state of the CPU, thus allowing the battery to be charged even if the CPU is powered down. Minimum/Maximum charging voltage is 8V/18.4V and minimum/maximum charging current 7mA/3A. Supply voltage has to be 12% higher as peak charging voltage.

## **7.6. Video Input / Output**

The SAA7118E is a combination of a four-channel analog preprocessing circuit including source selection, anti-aliasing filter and ADC, an automatic clamp and gain control, a Clock Generation Circuit (CGC), a digital multistandard decoder containing two-dimensional chrominance/luminance separation by an adaptive comb filter and a high performance scaler, including variable horizontal and vertical up and downscaling and a brightness, contrast and saturation control circuit. The target application for the SAA7118E is to capture and scale video images, to be provided as digital video stream through the image port of the VGA controller for overlay purposes. Up to 16 CVBS, 8 S-VIDEO or 4 Component inputs are supported. Software control is integrated in the system BIOS and sample applications are available.

## **7.7. Wide range DC power supply**

The power supply of the board has an input range from 8V to 28V DC. The power supply switches over to battery supply, if the main power supply voltage falls below 8V. All internal supply voltages are generated on board.

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## **7.8. PC-Card Interface**

The PCI1410A device integrated onboard the ePanel-C3 is a high-performance PCI-to-PC Card controller that supports a single PC Card socket compliant with the PC Card Standard. The PC Card Standard retains the 16-bit PC Card specification defined in PCI Local Bus Specification and defines the new 32-bit PC Card, CardBus, as being capable of full 32-bit data transfers at 33 MHz. The PCI1410A device supports both 16-bit and CardBus PC Cards, powered at 5V or 3.3V, as required. All card signals are buffered internally to allow hot insertion and removal.

## **7.9. Flatpanel-Interface**

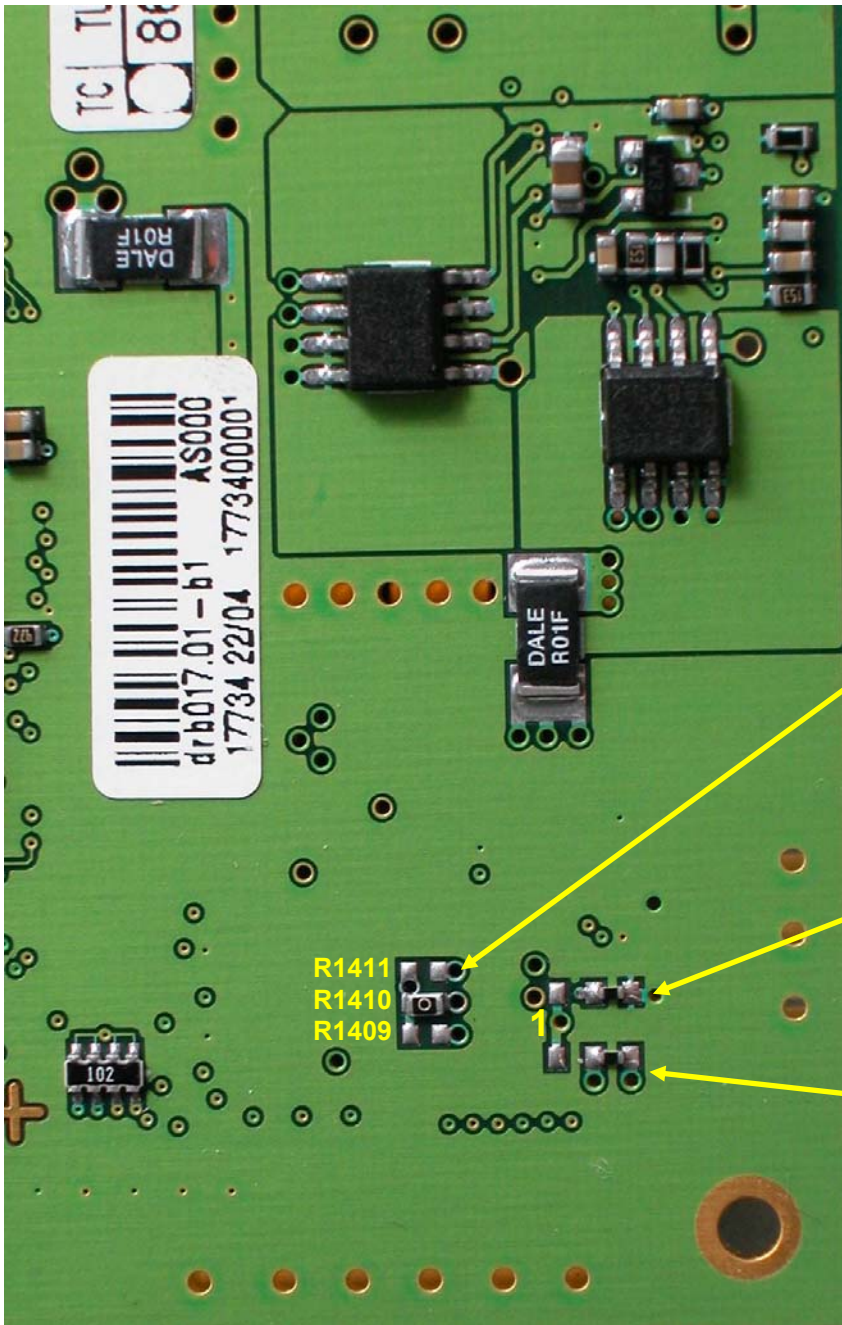
The display controller supports LVDS and digital RGB TFT flatpanels from 640 x 480 up to 1600 x 1200 pixels and up to 16 Mio. colors. The resolution and the type of flatpanel interface supported can be setup in the BIOS. Please refer to the BIOS section in this manual.

## **7.10. Backlight control and power supply**

A connector (X1402) to drive a backlight inverter for flat panels is provided onboard. Power supply for the backlight can be either 5V@1000mA or 12V@1000mA. A software controlled voltage ( 0V-5V ) is provided for dimming purposes.

Preliminary

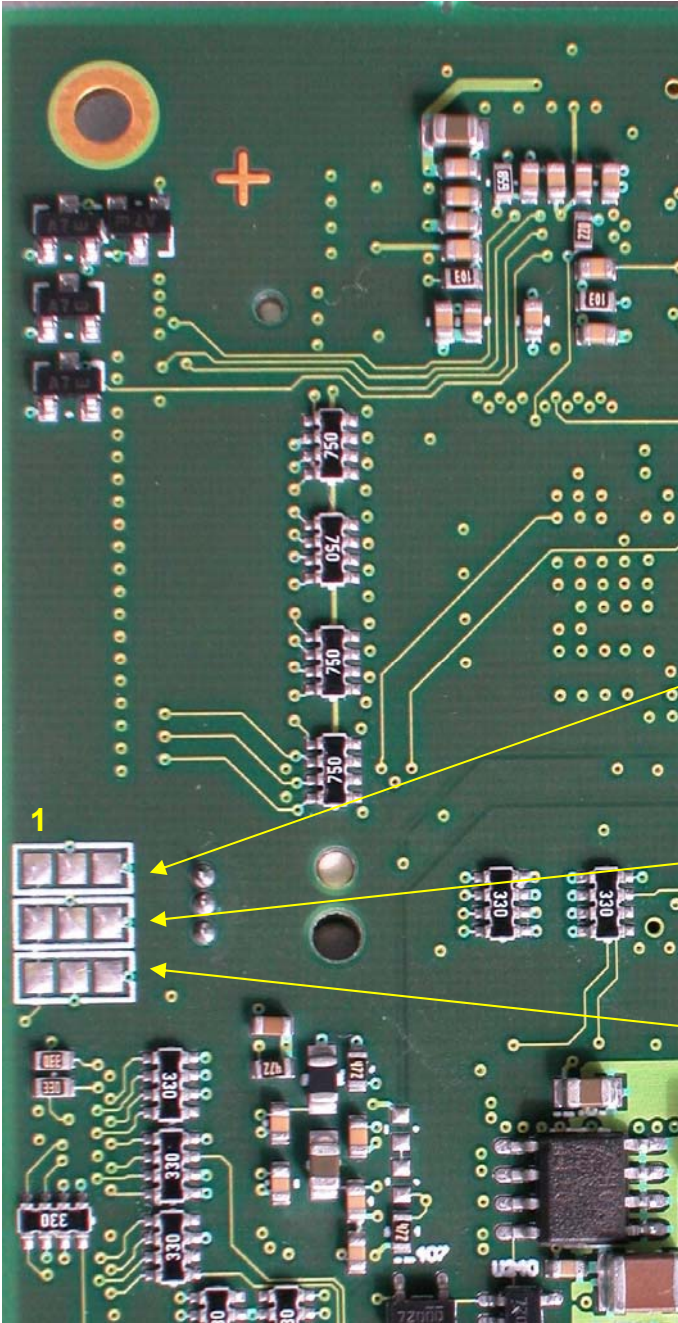
## 8. JUMPER SETTINGS



**Panel Vcc**  
R1411 +12V  
R1410 +5V  
R1409 +3,3V

**BKLT\_ON**  
J1402  
1 - 2 /ON  
2 - 3 ON

**BKLT\_VCC**  
J1400  
1 - 2 +5V  
2 - 3 +12V

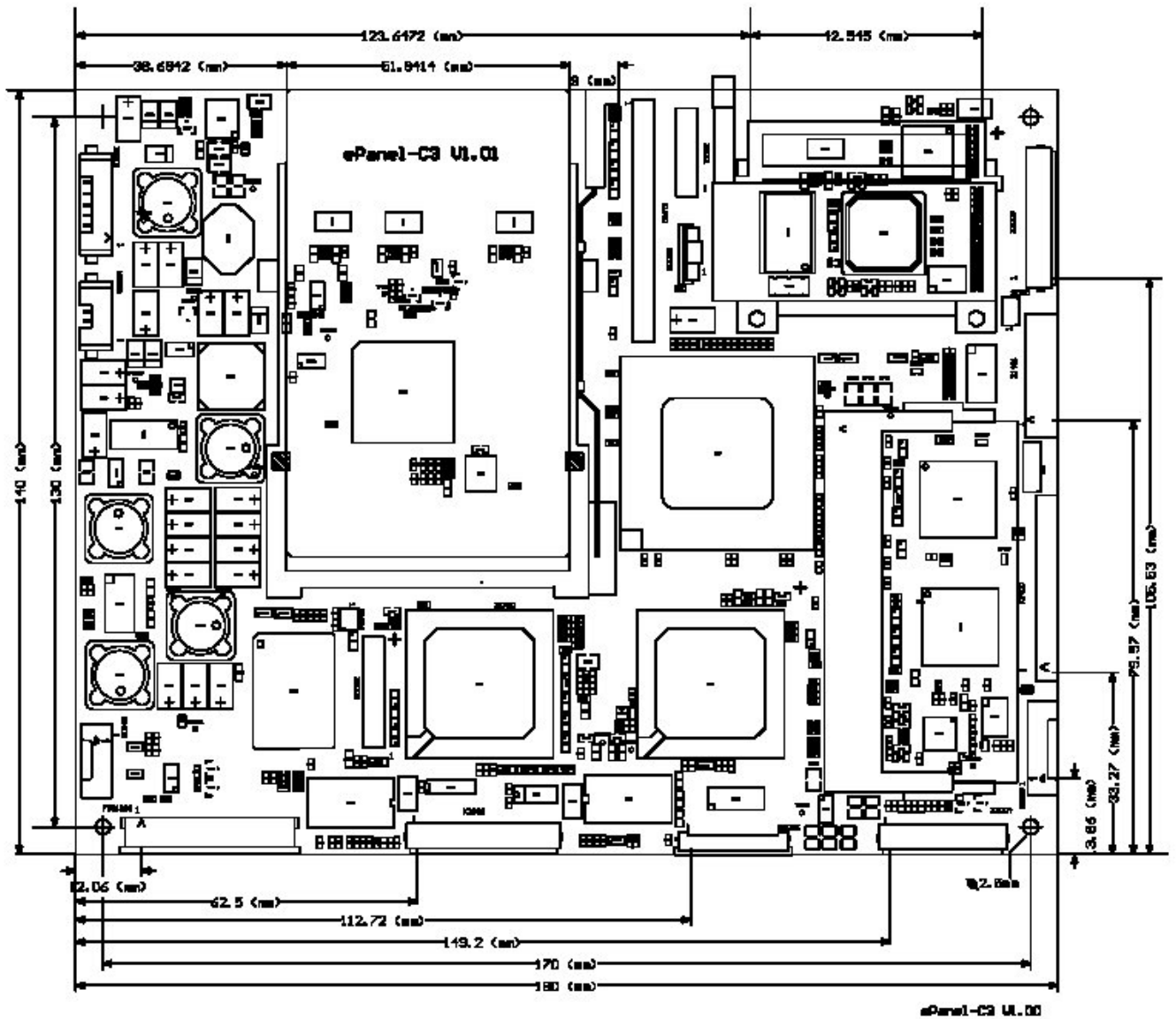


**JP1400**  
**Left/Right**  
Rotate image in  
right or left  
**Default open**

**JP1401**  
**UP/Down**  
Rotate image up or  
down  
**Default open**

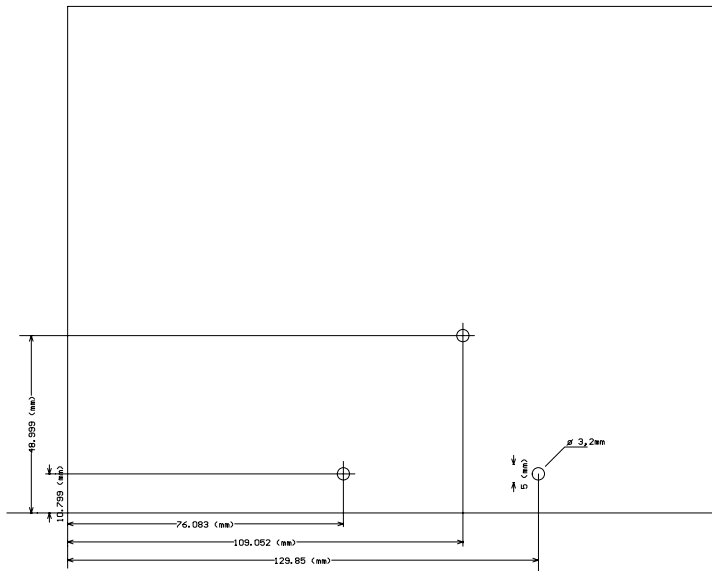
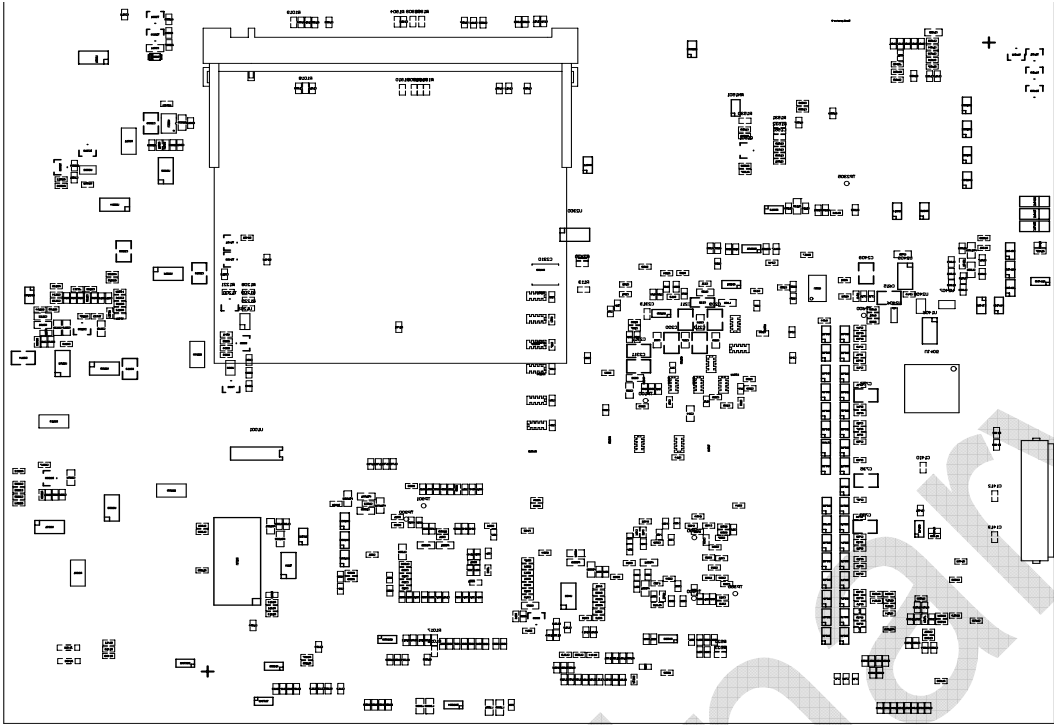
**JP1402**  
**Reserved**

# 9. MECHANICAL DIMENSIONS



NOTE: all dimensions in [mm]





Frontside positions of mounting holes for heatspreader

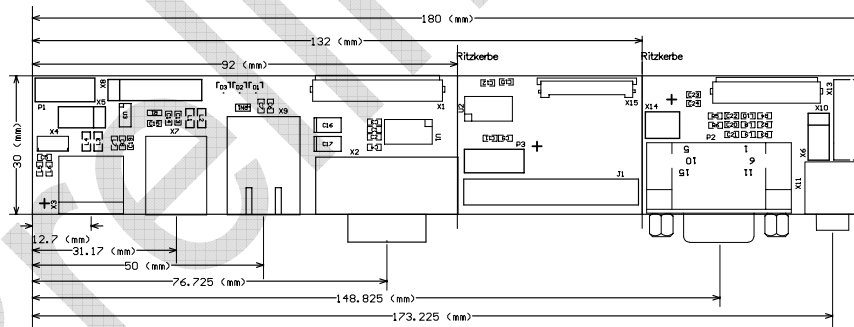
## 10. EVALUATION I/O-ADAPTERS

Kontron provides you with the evaluation I/O-adapters which makes all interfaces supported by **ePanel-C3** easy accessible.

Following interfaces are accessible on **ePanel-ADAPT**:

- Sound output ( Stereo )
- Sound input ( Stereo )
- Microphone input ( Mono )
- two USB-ports
- Printer port LPT1
- VGA-CRT
- Two serial ports COM1/COM2 ( RS232C )
- Ethernet
- PS/2-Mouse
- PS/2-Keyboard
- IrDA
- Feature connector with Reset-Input, Power-On-Button, Power-ON-LED
- Backup battery input ( 3V DC )
- Mechanical dimension: 180,00 x 30,00 mm

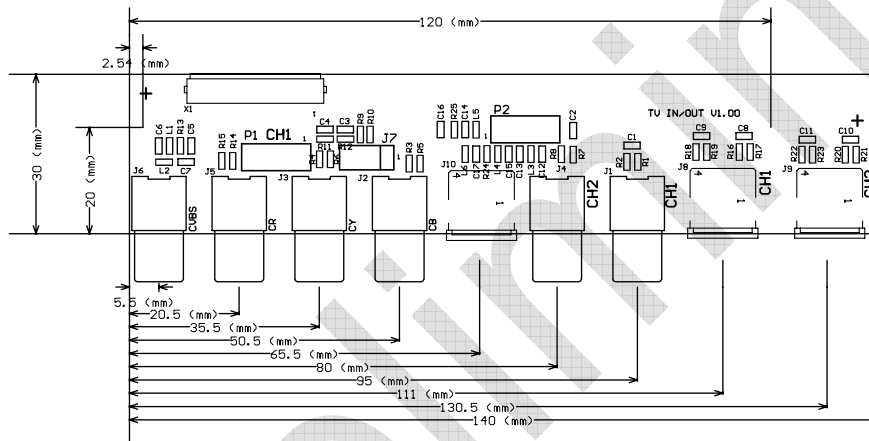
The schematics of the I/O-adapter ePanel-ADAPT is available as PDF-file on the support page [www.kontron-hh.com](http://www.kontron-hh.com).



Following interfaces are accessible on **ePanel-ADAPT-TV**:

- Video inputs ( 2 x Composite Video, 2 x S-VIDEO, 1 x RGB
- Video Outputs ( 1 x S-VIDEO, 1 x Composite Video, 1 x RGB )
- Mechanical dimension: 140,00 x 30,00 mm

The schematics of the I/O-adapter ePanel-ADAPT-TV is available as PDF-file on the support page [www.kontron-hh.com](http://www.kontron-hh.com).



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## 11. SPECIFICATIONS

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### 11.1. Mechanical specifications

Dimensions: length x width 180,0 x 140,0 mm  
Height: approx. 15 mm (21mm with Heatspreader and Fan)

### 11.2. Electrical specifications

Supply voltage:	8V DC up to 28V DC +/- 10%
Supply voltage ripple:	100 mV peak to peak 0 - 20 MHz
Supply current (typical, Setup-Prompt): ePanel-C3 @ 1 GHz + 256 MB DDRAM w/o Flatpanel and Backlight Inverter	2325mA @ 8V (ca. 18.6 W) 1550mA @ 12V DC (ca. 18.6 W) 780mA @ 24V DC (ca. 18.8 W)
Supply current (typical, Setup-Prompt): ePanel-C3 @ 733MHz + 256 MB DDRAM w/o Flatpanel and Backlight Inverter	2070mA @ 8V (ca. 16.5W) 1370mA @ 12V DC (ca. 16.4 W) 695mA @ 24V DC (ca. 16.7W)
Supply current (typical, Setup-Prompt): ePanel-C3 @ 300MHz + 256 MB DDRAM w/o Flatpanel and Backlight Inverter	1550mA @ 8V (ca. 12,4W) 1030mA @ 12V DC (ca. 12.3 W) 520mA @ 24V DC (ca. 12.5W)

### 11.3. Environmental specifications

**Temperature:** operating +5 °C to + tbd °C (\*)  
non operating: -10 °C to +85 °C

**Humidity:** operating: 10% to 90% (non-condensing)  
non operating: 5% to 95% (non-condensing)

**Mechanical :** Shock : tbd  
Vibration : tbd

**Altitude :** operating : tbd  
non-operating : tbd

**(\*) The maximum operating temperature is the maximum measurable temperature on any spot on the modules surface. It is the user's responsibility to maintain this temperature within the specification, which is set by the IC manufacturer.**

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## **12. LITERATURE, STANDARDS, LINKS**

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It is not in the responsibility of **Kontron** to supply you with informations about standard PC technology. Please find below a selection of different information sources for your convenience.

### **12.1. ISA-Bus, standard connectors**

- **ISA System Architecture**, Addison-Wesley Publishing Company, ISBN 0-201-40996-8
- **AT BUS Design IEEE P996 Compatible**, Edward Solari, Annabooks San Diego CA. ISBN 0-929392-08-6  
[www.annabooks.com](http://www.annabooks.com)
- **PC Handbook, Sixth Edition**, John P. Choisser and John O. Foster, Annabooks San Diego CA. ISBN 0-929392-36-1, [www.annabooks.com](http://www.annabooks.com)
- **AT IBM Technical Reference Vol 1&2**, 1985
- **ISA Bus Specifications and Application Notes**, January 30, 1990, Intel
- **Technical Reference Guide, Extended Industry Standard Architecture Expansion Bus**, Compaq 1989
- **Personal Computer Bus Standard P996**, Draft D2.00, January 18, 1990, IEEE Inc
- **Embedded PCs**, Markt&Technik GmbH, ISBN 3-8272-5314-4 (german)

### **12.2. PCI specifications**

- **PCI Special Interest Group**, c/o Intel Corporation
- **PCI System Architecture**, Addison-Wesley Publishing Company, ISBN 0-201-40993-3

### **12.3. RS232C**

- **EIA-232-E Interface between data terminal equipment and data circuit-terminating equipment employing serial binary data interchange (ANSI/IEA-232-D)**

### **12.4. USB**

The USB specification maybe obtained from the USB Implementers Forum web site at [www.usb.org](http://www.usb.org)

### **12.5. Smart Battery System Specification ( SBS )**

The Smart Battery System specification maybe obtained from the Smart Battery System Implementers Forum web site at [www.sbs-forum.org](http://www.sbs-forum.org)

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### **13. DOCUMENT REVISION HISTORY**

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<b>Filename</b>	<b>Date</b>	<b>Edited by</b>	<b>Alteration to previous document revision</b>
ePanel-C3_M100.DOC	01.09.04	D.Piper, L.Trotter	Initial release
ePanel-C3_M101.DOC	13.09.04	L.Trotter	Preliminary Release

Preliminary