

PCE-5130

Socket M Intel® Core™ 2 Duo /
Core™ Duo / Celeron-M
processor PICMG 1.3 CPU Board
with PCIe / DDR2 / VGA / Dual
GbE LAN

Trusted ePlatform Services

ADVANTECH

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This device complies with the requirements in part 15 of the FCC rules:

- Operation is subject to the following two conditions:
- This device may not cause harmful interference
- This device must accept any interference received, including interference that may cause undesired operation

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this device in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense. The user is advised that any equipment changes or modifications not expressly approved by the party responsible for compliance would void the compliance to FCC regulations and therefore, the user's authority to operate the equipment.

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Memory Compatibility

Brand	Size	Speed	Type	ECC	Vendor PN	Advantech PN	Memory
Apacer	512 MB	DDR2 533	DDR2	N	78.91G66. 420	96D2- 512M533NN-AP	ELPIDA E5108AG- 5C-E (64x8)
	512 MB	DDR2 667	DDR2	N	78.91G92. 420	N/A	ELPIDA E5108AG- 6E-E (64x8)
	1 GB	DDR2 533	DDR2	N	78.01066. 400	N/A	SAMSUNG K4T51083QB- ZKD5 (128x4)
	1 GB	DDR2 533	DDR2	N	78.01G66. 420	96D2-1G533NN- AP	ELPIDA E5108AGBG-6E-E (64x8)
	1 GB	DDR2 667	DDR2	N	78.01G92. 420	N/A	ELPIDA E5108AGBG-6E-E (64x8)
	2 GB	DDR2 669	DDR2	N	78.A1G90 .404	96D2-2G667-AP	SEC K4T1G08400 (128x8)
DSL	512 MB	DDR2 533	DDR2	N	N/A	N/A	infineon HYB18T512 800AF37 FSS43331 (64x8)
	1 GB	DDR2 533	DDR2	N	N/A	N/A	ELPIDA E5108AE- 5C-E (64x8)
	1 GB	DDR2 667	DDR2	N	N/A	N/A	ELPIDA E5108AGBG-6E-E (64x8)
	2 GB	DDR2 667	DDR2	N	N/A	N/A	ELPIDA E1108ACSE-6E- E(128x8)
Kingston	2 GB	DDR2 667	DDR2	N	KVR667D 2N5/2G	N/A	Micron 7KE12 D9HNL (128x8)

Transcend	256 MB	DDR2 533	DDR2 N	TS32MLQ 64V5F		SAMSUNG 443 K4T56083QF-GCD5 (32x8)
	256MB	DDR2 533	DDR2 N	TS32MLQ 64V5M	96D2-256M533NN-TR	infineon HYB18T512160AF 3.7 3VV21710 (32x16)
	512MB	DDR2 533	DDR2 N	TS64MLQ 64V5J	96D2-512M533NN-TR1	SEC K4T51083QC ZCD5 (64X8)
	512MB	DDR2 667	DDR2 N	TS6QNJ2 2850-6S/ TS64MLQ 64V6J	96D2-512M667NN-TR	SAMSUNG K4T51083QC ZCE6 (64x8)
	1GB	DDR2 533	DDR2 N	TS128ML Q64V5J	96D2-1G533NN-TR1	SEC K4T51083QC ZCD5 (64X8)
	1GB	DDR2 667	DDR2 N	TS2QNJ2 3450-6S	96D2-1G667NN-TR	SEC K4T51083QE ZCE6 (64x8)
	1GB	DDR2 668	DDR2 N	TS2QNJ2 3450-6S/ TS128ML Q64V6J	96D2-1G667NN-TR	SEC K4T51083QG HCE6 (64x8)
	1GB	DDR2 667	DDR2 N	N/A	N/A	SEC K4T51083QC ES
	2GB	DDR2 669	DDR2 N	TS5QNU2 3451-6S	96D2-2G667-TR	SAMSUNG K4T1G084QD-ZCE6 (128x8)
	2GB	DDR2 667	DDR2 N	TS256ML Q64V6U	N/A	Micron 7HE12 D9HNL (128x8)
	2GB	DDR2 667	DDR2 N	TS256ML Q64V6U	N/A	SAMSUNG K4T1G084QA-ZCE6 (128x8)

Network Feature Comparison

LAN/Model	PCE-5130G2	PCE-5130VG
LAN1: Intel 82574	Yes	Yes
LAN2: Intel 82573	Yes	No

Product Warranty (2 Years)

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2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Initial Inspection

Before you begin installing your motherboard, please make sure that the following materials have been shipped:

■	1 PCE-5130 PICMG 1.3 Single Host Board	
■	1 PCE-5130 startup manual	P/N: 2002513010
■	1 CD with utility	P/N: 2062513000
■	1 FDD cable	P/N: 1700340640
■	1 User note for full-sized CPU card	P/N: 2002721020
■	2 Serial ATA HDD data cable	P/N: 1700003194
■	2 Serial ATA HDD power cable	P/N: 1703150102
■	1 COM + printer ports cable kit	P/N: 1701260305
■	1 4-port USB cable kit(Only for VG Sku)	P/N: 1700008461
■	1 2-port USB cable kit (Only for G2)	P/N: 1700002204
■	1 Keyboard and mouse Y cable	P/N: 1700060202
■	1 jumper package	P/N: 9689000068
■	1 warranty card	P/N: 2190000902
■	1 Ultra ATA 66/100 HDD cable	P/N: 1701400452
■	1 CPU Cooler	P/N: 1750000246

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the PCE-5130 mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. As you unpack the PCE-5130, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

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Chapter 1

Hardware Configuration

1.1 Introduction

PCE-5130 is a PICMG 1.3 form-factor single host board which is designed with Intel 945GME, plus ICH7M-DH platform for industrial applications that require mainstream computing capability and low power consumption.

PCE-5130 supports Intel Core™2 Duo, Core™ Duo and Celeron® M processors with FSB up to 667 MHz and DDR2 400/533/667 MHz SDRAM up to 4 GB. With mainstream computing technology and low power consumption, PCE-5130 is suitable for industrial applications in high temperature environments or in compact enclosures.

PCE-5130 offers high-performance, cost-saving integrated graphics, a built-in Intel® 945GME chipset, and features the unique Intel® Graphics Media Accelerator 950, which maximizes graphic performance and shares system memory up to 224 MB. PCE-5130 also supports an LVDS interface for digital panel connection.

PCE-5130 also has rich I/O interfaces; it has two SATA2 ports for connecting mainstream hard disks and optical drives, and the two on-board serial ports (COM ports) can be used for various industrial control applications. With one PCIe x16 and four PCIe x1 lanes going to the backplane, PCE-5130 can connect to various kinds of expansion slots such as PCI, PCI-X and PCIe slots with different backplanes.

With outstanding performance and exceptional features, PCE-5130 is an ideal computing platform for up-and-coming industrial applications, both for today and for tomorrow.

1.2 Features & Benefits

Table 1.1: Features & Benefits

Features	Benefits
Supports Intel® Core™2 Duo / Core Duo/Celeron® M Series processors	Supports FSB 533/667 MHz Core™2 Duo/Core™ Duo/Celeron® M mobile processors with maximum 34 W thermal design power for applications that require low power consumption in compact-size enclosures, such as 1U, 2U chassis
Dual Channel DDR2 400/533/667 DIMMs	Supports DDR2 667MHz up to 4 GB (mainstream and high availability)
Cost-saving integrated graphics core	VGA and LVDS for Dual Display and Digital Panel applications
Dual Gigabit Ethernet LAN via dedicated PCI Express x1 Lanes for intense networking	Provides high throughput for heavy-load networking applications
Dual COM ports with RS232/422/485	Dual SATA ports for SATA interface HDDs or ODDs, 2 comports with RS232/422/485 for controlling equipment applications

1.3 Specifications

1.3.1 System

- **CPU:** Intel Core 2 Duo / Core Duo / Celeron M Sequence Processors with 533/ 667 MHz FSB
- **L2 Cache:** Up to 4 MB depends on CPU, Celeron M or Core Solo/Duo, or Merom CPU category
- **BIOS:** Award SPI BIOS (16Mb SPI)
- **System Chipset:** 945GME GMCH plus ICH7M-DH ICH
- **SATA hard disk drive interface:** Two onboard SATA connectors with data transmission rates of up to 150 MB/s. These interfaces can be enabled/disabled in the BIOS
- **Floppy disk drive interface:** Supports one floppy disk drive, 5.25" (360 KB and 1.2 MB) or 3.5" (720 KB, 1.44 MB). These interfaces can be enabled/disabled in the BIOS

1.3.2 Memory

- **RAM:** Up to 4 GB in two 240-pin DIMM sockets. Supports dual-channel DDR2 400/533 / 667 MHz SDRAM

1.3.3 Input/Output

- **PCI express lanes:** One PCIe x16 and four PCIe x1 lanes to the backplane
- **PCI bus:** Four PCI masters to the backplane, 32-bit, 33 MHz PCI 2.2 compliant
- **Enhanced parallel port:** This EPP/SPP/ECP port can be configured to LPT1. A standard DB-25 female connector provided
- **Serial ports:** Two serial ports, one is RS 232 and other one is RS-232 / 422 / 485
- **PS/2 keyboard and mouse connector:** One 6-pin mini-DIN connectors is located on the mounting bracket for easy connection to a PS/2 keyboard and mouse via the Y-cable included in the package
- **USB port:** Supports up to eight USB 2.0 ports with transmission rate up to 480 Mbps. 3 or 4 ports are on the CPU card and 4 ports are on the backplane

1.3.4 Graphics

- **Controller:** Intel® 945GME integrated Intel® GMA 950
- **Display memory:** Dynamically shared system memory up to 224 MB
- **CRT:** Up to 2048 x 1536 resolution, 400 MHz integrated 24 bit RAMDAC, Dual independent display options with digital display, Support CRT Hot plug
- **PCI express x16 slot on the backplane:** An external graphic card can be installed in the PCIe x16 slot for stronger 2D/3D graphic capability

1.3.5 Ethernet LAN

- Supports single/dual 10/100/1000 Mbps Ethernet port(s) via the dedicated PCI Express x1 bus which provides 500 MB/s data transmission rate
- **Controller:**
 - LAN 1: Intel 82574 (G2 version or VG version)
 - LAN 2: Intel 82573 (G2 Version)

1.3.6 Industrial features

- **Watchdog timer:** Can generate a system reset or IRQ11. The watchdog timer is programmable, with each unit equal to one second or one minute (255 levels)

1.3.7 Mechanical and environmental specifications

- **Operating temperature:** 0 ~ 60° C (32 ~ 140° F, Depending on CPU)
- **Storage temperature:** -20 ~ 70° C (-4 ~ 158° F)
- **Humidity:** 20 ~ 95% non-condensing
- **Power supply voltage:** +12 V, +5 V, +3.3 V, +5 VSB
- **Power consumption: Maximum:**
CPU: Intel Core 2 Duo Processor T7600;
Memory: 2 DDR2 667 MHz 2 GB DIMMs

Voltage	+12 V	+5 V	+3.3 V	+5 VSB
Current	2.81 A	0.99 A	2.47 A	0.25 A
- **Board size:** 338.58 mm (L) x 126.39 mm (W) (13.3" x 4.98")
- **Board weight:** 0.490 kg

1.4 Jumpers and Connectors

Connectors on the PCE-5130 single host board link it to external devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers used to configure your system for your application.

The tables below list the function of each of the board jumpers and connectors. Later sections in this chapter give instructions on setting jumpers. Chapter 2 gives instructions for connecting external devices to your motherboard.

Table 1.2: Jumper list

Label	Function
CMOS1	CMOS clear
JWDT1	Watchdog Reset
JOBS1	HW Monitor Alarm
JSETCOM2	COM2 RS-232/422/485 selection

Table 1.3: Connector list

Label		Function
IDE1		Primary IDE connector
FDD1		FDD connector
LPT1		Parallel port, Parallel port x 1, supports SPP/EPP/ECP mode
LAN1		GbE LAN1 / Intel 82574
LAN2		GbE LAN2 / Intel 82573
VGA1		VGA connector
KBMS1		PS/2 keyboard and mouse connector
KBMS2		External keyboard/mouse connector
COM1		Serial port: COM1; RS-232 (Box Header)
COM2		Serial port: COM2; RS-232 / 422 / 485 (G2 version: 9-pin Box Header; VG version: 9-pin D-Sub)
JSETCOM2		COM2 RS-232/422/485 mode selection
JIR1		Infrared connector
JFP3 (Keyboard Lock and Power LED)	Power LED	Suspend: Fast flash (ATX/AT)
		System On: ON (ATX/AT)
		System Off: OFF (AT)
		System Off: Slow flash (ATX)
JFP2		External speaker / SATA HDD LED connector
JFP1		Power Switch / Reset connector
JCASE1		Case Open
CPUFAN1		CPU FAN connector (4-pin)
LANLED1		LAN1/2 LED extension connector
HDAUD1		Connector for HD audio extension module
USB12		USB port 1, 2
USB34		USB port 3, 4
SATA1		Serial ATA1
SATA2		Serial ATA2
CPU1		CPU Socket
DIMMA1		Memory connector channel A
DIMMB1		Memory connector channel B
GPIO1		GPIO pin header (SMD pitch-2.0 mm)
VP1		LVDS Panel Back Light Power Connector
LVDS1		LVDS Connector

1.5 Board Layout: Jumper and Connector Locations

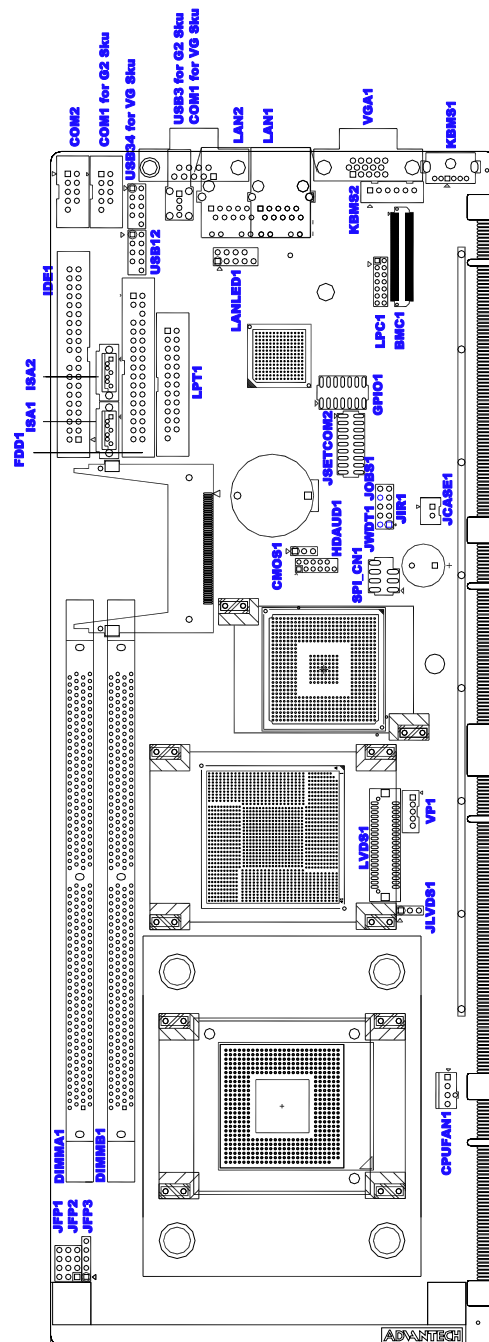


Figure 1.1 Jumper and connector locations

1.6 PCE-5130 Block Diagram

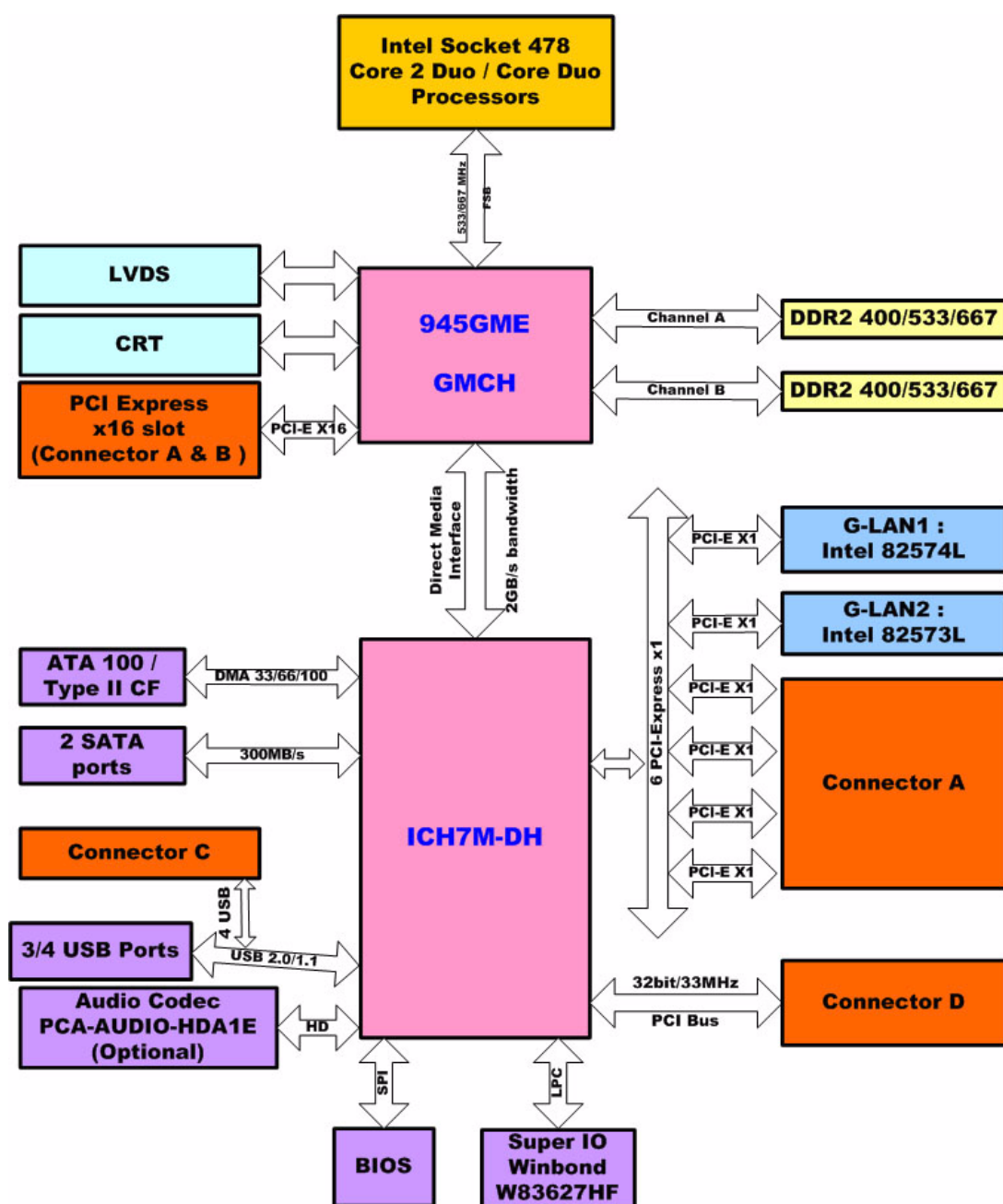


Figure 1.2 PCE-5130 block diagram

1.7 Safety Precautions

Warning! *Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.*



Caution! *Always ground yourself to remove any static charge before touching the motherboard. Modern electronic devices are very sensitive to static electricity discharges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.*



Caution! *The computer is provided with a battery-powered real-time clock. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacturer. Discard used batteries according to manufacturer's instructions.*



Caution! *There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.*



1.8 Jumper Settings

This section provides instructions on how to configure your motherboard by setting the jumpers. It also includes the motherboard's default settings and your options for each jumper.



1.8.1 How to set jumpers

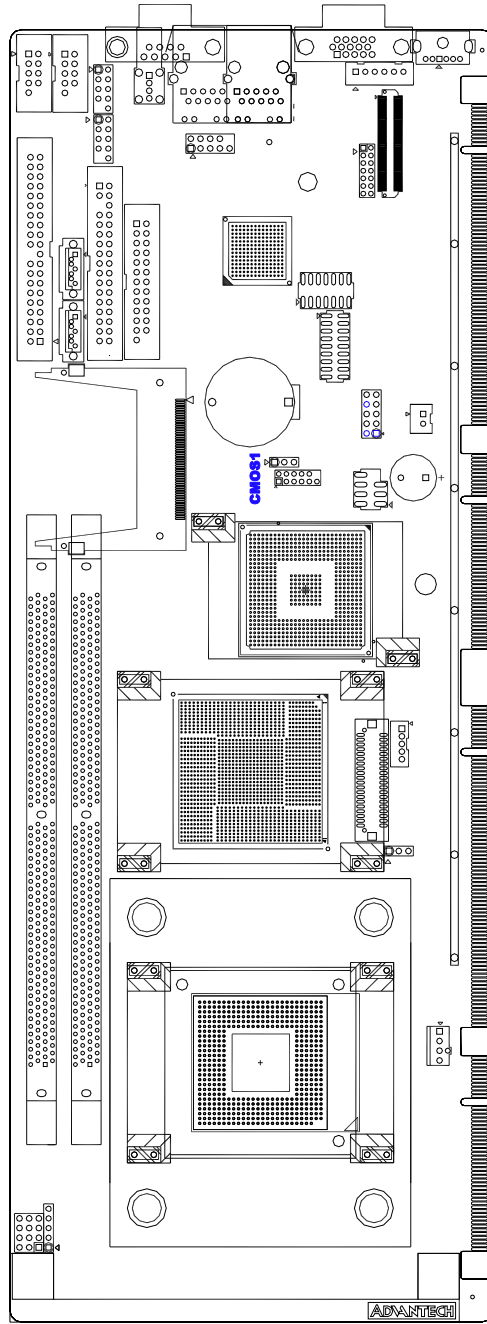
You can configure your motherboard to match the needs of your application by setting the jumpers. A jumper is a metal bridge that closes an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" (or turn ON) a jumper, you connect the pins with the clip. To "open" (or turn OFF) a jumper, you remove the clip. Sometimes a jumper consists of a set of three pins, labeled 1, 2 and 3. In this case you connect either pins 1 and 2, or 2 and 3. A pair of needle-nose pliers may be useful when setting jumpers.

1.8.2 CMOS clear (CMOS1)

The PCE-5130 CPU card contains a jumper that can erase CMOS data and reset the system BIOS information. Normally this jumper should be set with pins 1-2 closed. If you want to reset the CMOS data, power off, disconnect, set J1 to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed. This procedure will reset the CMOS to its default setting.

Table 1.4: CMOS clear (CMOS1)



Function	Jumper Setting
* Keep CMOS data	 1-2 closed
Clear CMOS data	 2-3 closed
* default setting	



1.8.3 Watchdog timer output (JWDT1)

The PCE-5130 contains a watchdog timer that will reset the CPU or send a signal to IRQ11 in the event the CPU stops processing. This feature means the PCE-5130 can recover from a software failure or an EMI problem. The J2 jumper settings control the outcome of what the computer will do in the event the watchdog timer is tripped.

Table 1.5: Watchdog timer output (JWDT1)

Function	Jumper Setting
IRQ11	 1-2 closed
*Reset	 2-3 closed
* default setting	

Note! *The interrupt output of the watchdog timer is a low level signal. It will be held low until the watchdog timer is reset.*



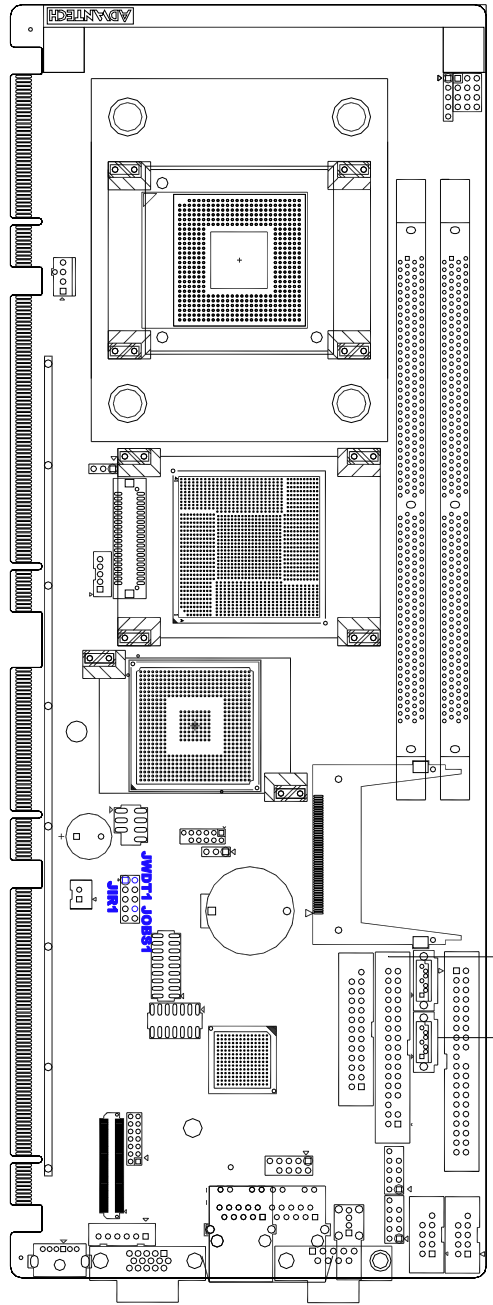




Table 1.6: H/W monitor alarm (JOBS1)

Function	Jumper Setting
Enable OBS alarm*	<div> <div> <div>1</div> <div>2</div> </div>  1-2 closed </div>
Disable OBS alarm	<div> <div> <div>1</div> <div>2</div> </div>  1-2 open </div>

* default setting

(JOBS1) is a 2-pin jumper that enables/disables the alarm for out-of-range on-board security (OBS) events, including fan speed, voltage, temperature, and case open. For parameter settings, see “PC Health Status” on page 51.

1.8.4 COM2 RS-232/422/485 mode selector (JESTCOM2)

Users can use JESTCOM2 to select among RS-232/422/485 modes for COM2. The default setting is RS-232.

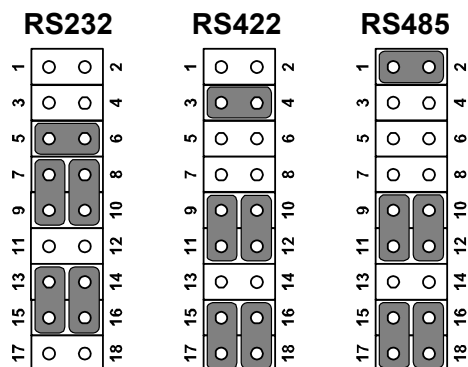


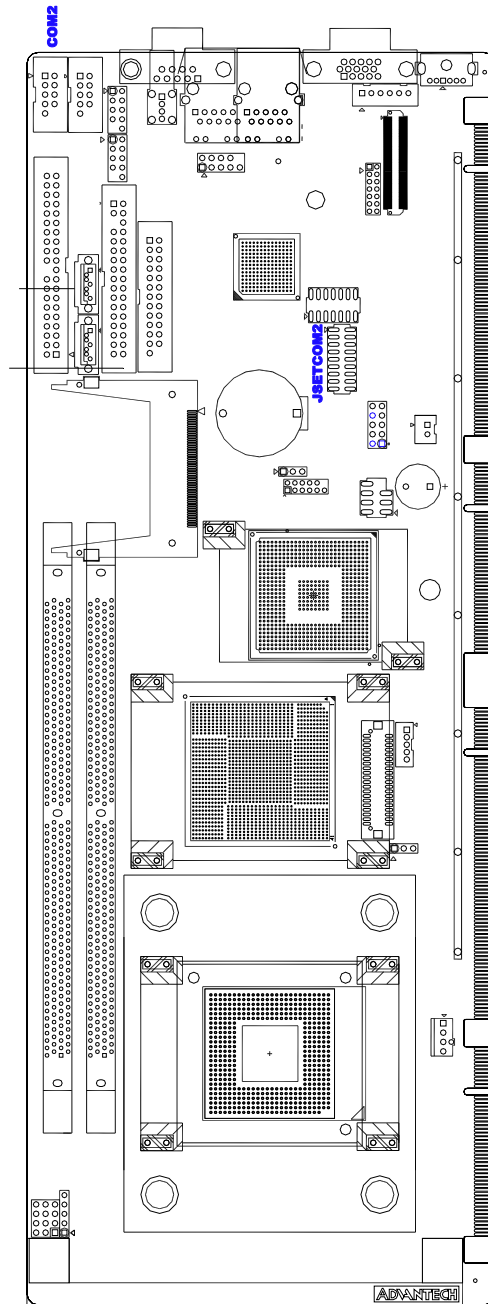
Figure 1.3 COM2 RS-232/422/485 jumper setting

Table 1.7: COM2 RS-232/422/485 mode selector

Function	Jumper Setting
RS-232	(5-6) + (7-9) + (8-10) + (13-15) + (14-16) closed
RS-422	(3-4) + (9-11) + (10-12) + (15-17) + (16-18) closed
RS-485	(1-2) + (9-11) + (10-12) + (15-17) + (16-18) closed

Note! RS-485 does not support auto flow control.





1.9 System Memory

The PCE-5130 has two sockets for 240-pin dual inline memory modules (DIMMs) in two memory channels.

Both sockets use 1.8 V unbuffered double data rate synchronous DRAMs (DDR SDRAM). They are available in capacities of 256 MB, 512 MB, 1024 MB and 2 GB. The sockets can be filled in any combination, with DIMMs of any size, giving a total memory size between 256 MB and 4 GB.

The PCE-5130 can accept DDR2 SDRAM memory chips without parity. Also note that the PCE-5130 accepts DDR2 400/533/667 MHz SDRAM, and DDR2 SDRAM. The PCE-5130 does NOT support ECC (error checking and correction).

1.10 Memory Installation Procedures

To install DIMMs, first make sure the two handles of the DIMM socket are in the “open” position, i.e. the handles lean outward. Insert the DIMM module into the plastic guides on both ends of the socket. Then press the DIMM module well down into the socket, until the two handles lock the memory module into position in the socket. To remove the memory module, just push both handles outward, and the memory module will be ejected.

1.11 Cache Memory

CPUs supported by PCE-5130 have 4 MB, 2 MB and 1 MB L2 cache memory sizes.

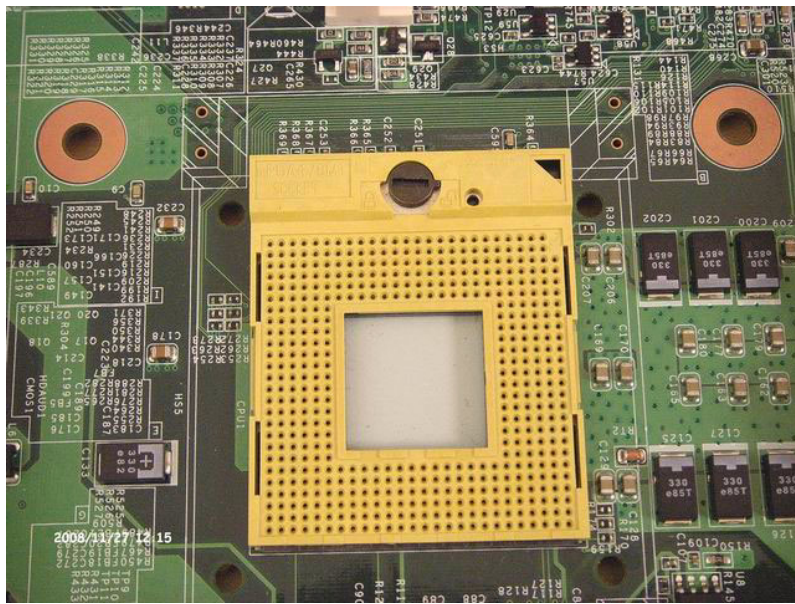
1.12 Processor Installation

Warning! Without a fan or heat sink, the CPU will overheat and cause damage to both the CPU and the single board computer. To install a CPU, first turn off your system. Locate the processor socket 479.

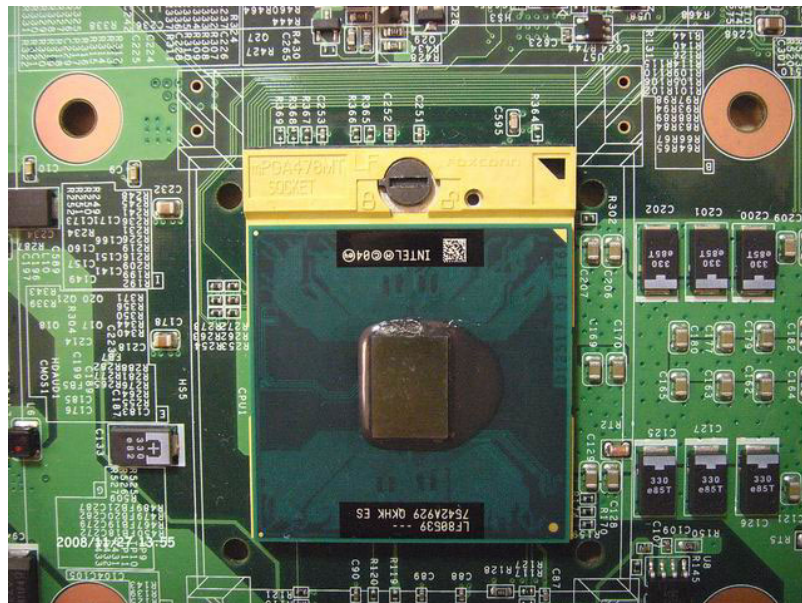


The PCE-5130 is designed for Intel Core™2 Duo/Core™ Duo/Core®-M processors (socket M) up to 2.33 GHz. Follow these steps to install the processor:

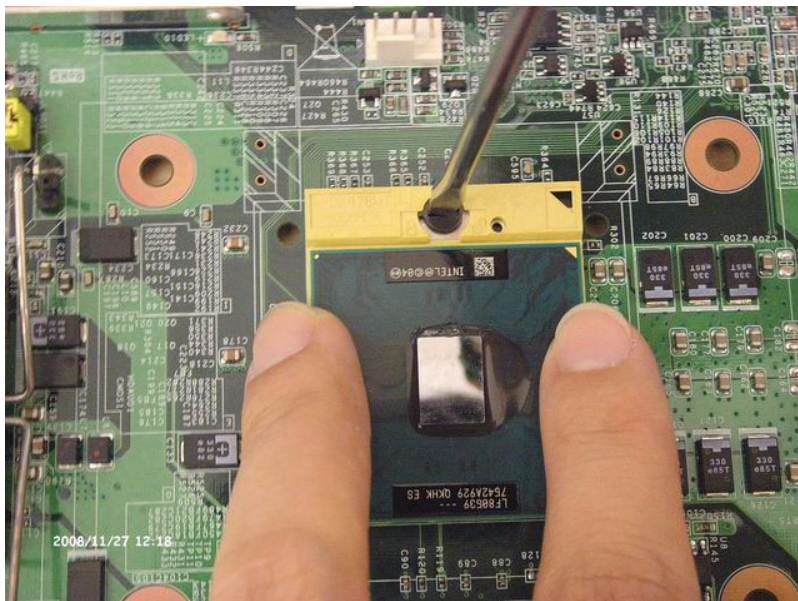
1. Turn the screw to release the pin contacts.



2. Align the triangular marking on the processor with the small arrow on the corner of the socket.



3. Turn the screw to its original position.



4. Use a small dab of thermal paste and install the heat sink on the CPU. The recessed area of the heat sink accommodates the capacitors, avoiding contact.



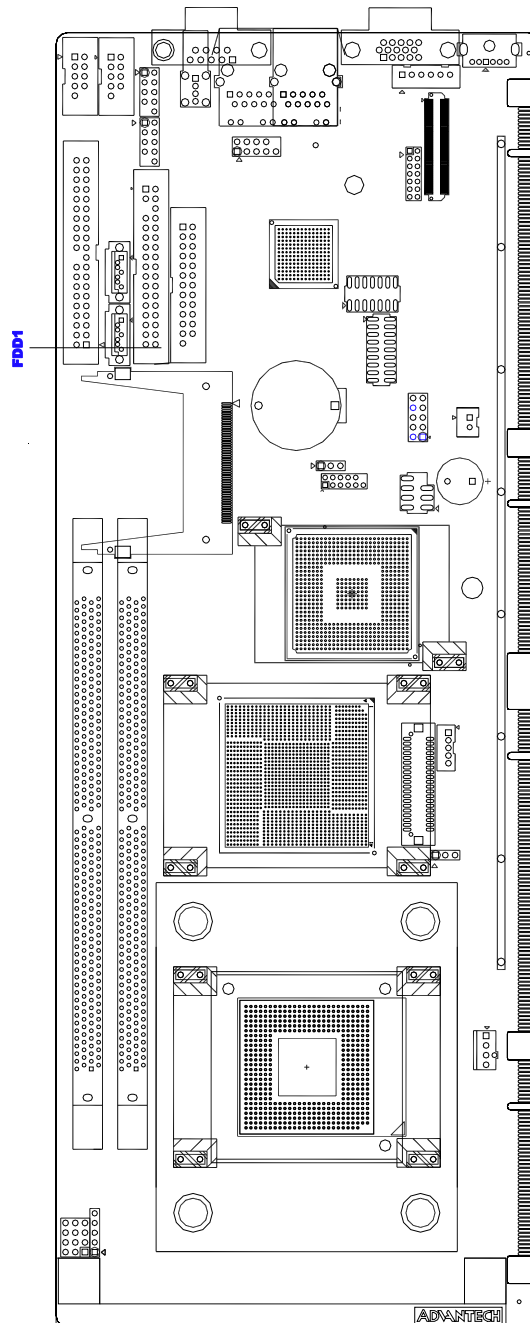
Chapter 2

Connecting
Peripherals

2.1 Introduction

You can access most of the connectors from the top of the board as it is being installed in the chassis. If you have a number of cards installed, you may need to partially remove the card to make all the connections.

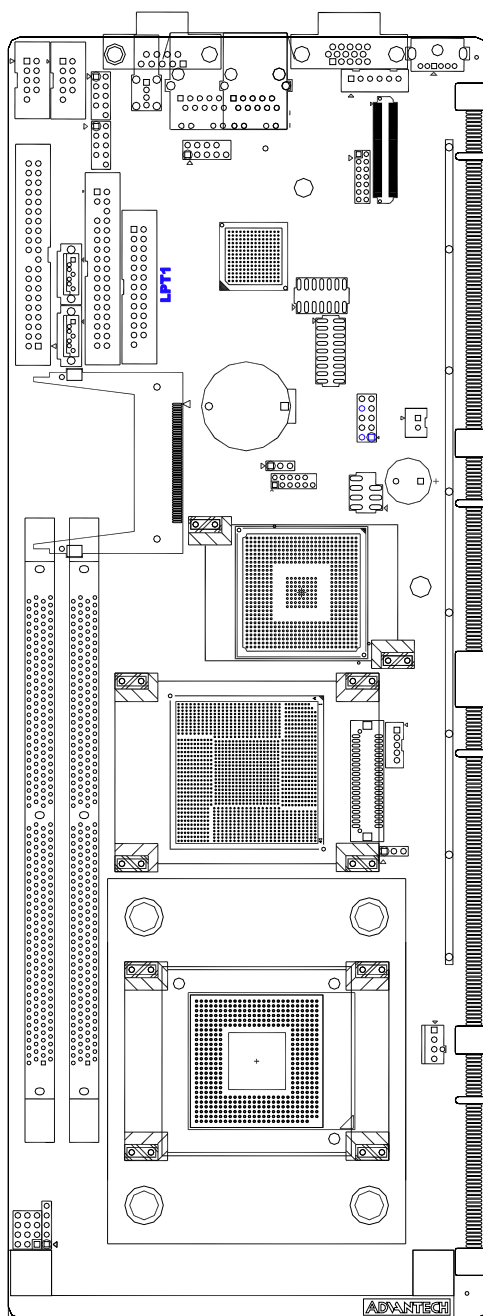
2.2 Floppy Drive Connector (FDD1)



You can attach up to two floppy disk drives to the PCE-5130's onboard controller. You can use 3.5" (720 KB, 1.44 MB) drives.

The motherboard comes with a 34-pin daisy-chain drive connector cable. On the board end of the cable is a 34-pin flat-cable connector. On the other end are two sets of 34-pin flat-cable connectors (usually used for 3.5" drives). The set on the end (after the twist in the cable) connects to the A: floppy drive. The set in the middle connects to the B: floppy drive.

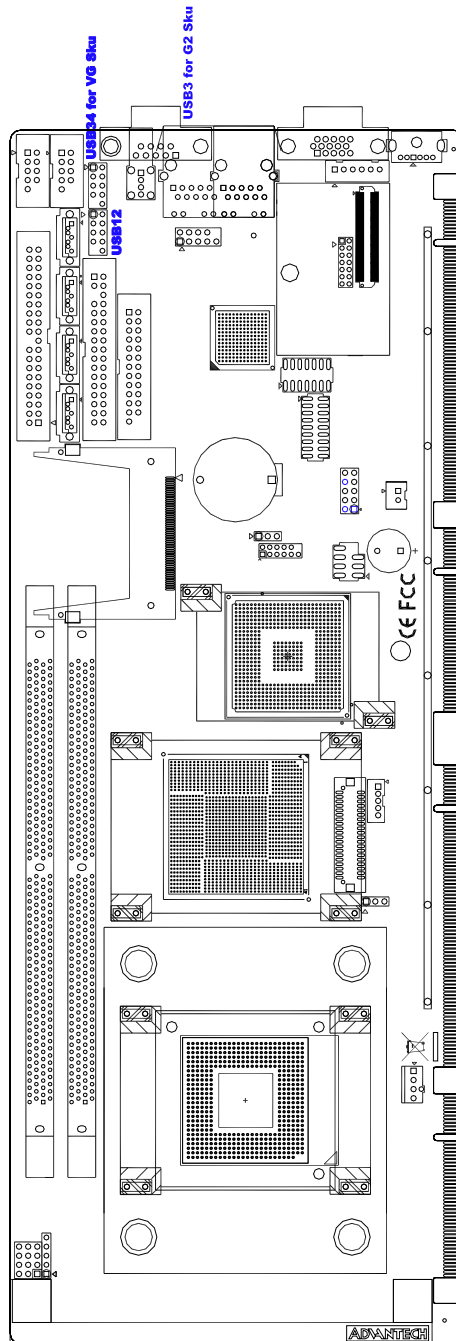
2.3 Parallel Port (LPT1)



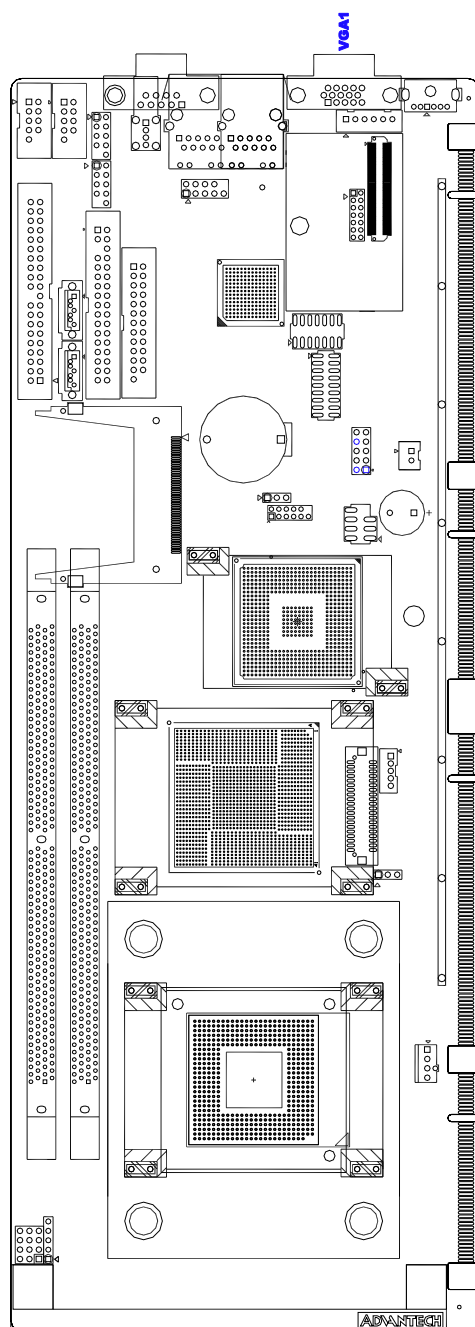
The parallel port is normally used to connect the motherboard to a printer. The PCE-5130 includes an onboard parallel port, accessed through a 26-pin flat-cable connector, LPT1.

2.4 USB Ports (USB12, USB34)

The PCE-5130 provides up to four USB (Universal Serial Bus) ports with complete Plug & Play and hot swap support for up to 127 external devices. These USB ports comply with USB Specification Rev. 2.0, support transmission rates up to 480 Mbps and are fuse protected. The USB interface can be disabled in the system BIOS setup.

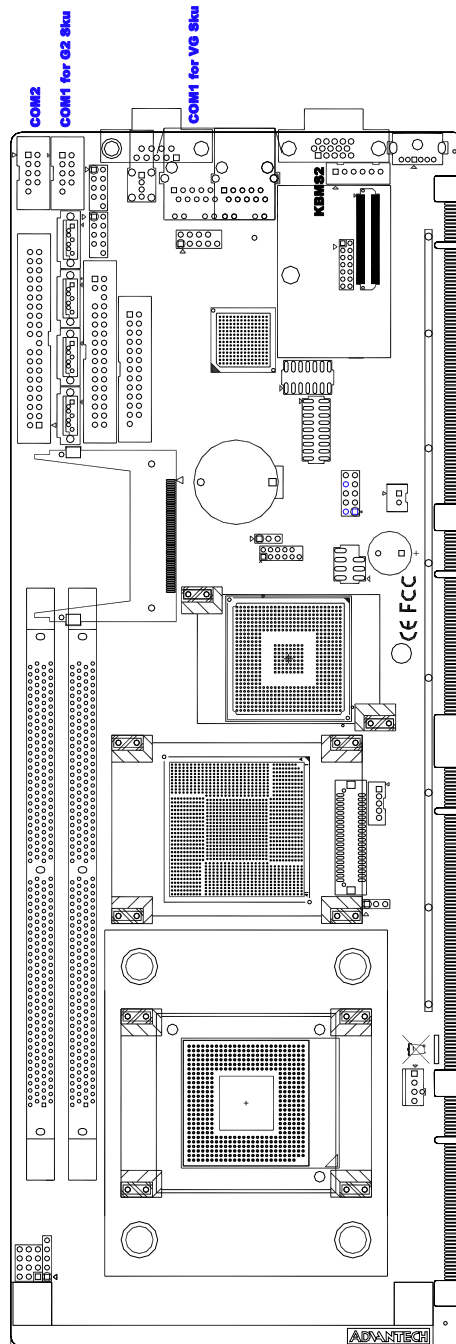


2.5 VGA Connector (VGA1)



The PCE-5130 includes a VGA interface that can drive conventional CRT displays. VGA1 is a standard 15-pin D-SUB connector commonly used for VGA. Pin assignments for VGA1 are detailed in Appendix B.

2.6 Serial Ports (COM1, COM2)



The PCE-5130 offers two serial ports. The user can use JSETCOM2 to select among RS-232/422/485 modes for COM2. These ports can connect to serial devices, such as a mouse or a printer, or to a communications network.

The IRQ and address ranges for both ports are fixed. However, if you want to disable the port or change these parameters later, you can do this in the system BIOS setup. Different devices implement the RS-232/422/485 standards in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector.

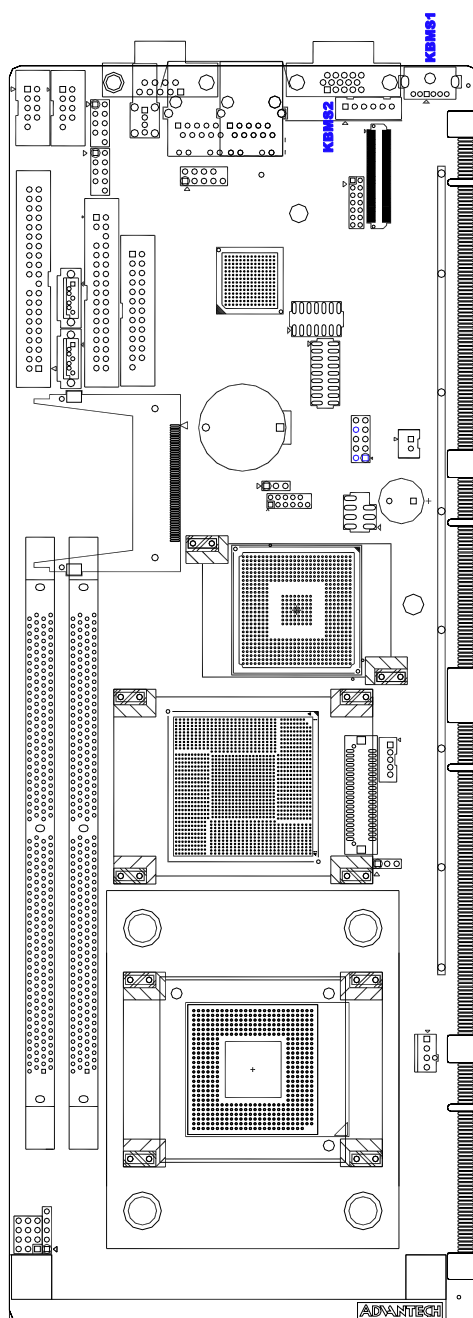
Note!



There are single COM cable kits for PCE-5130 COM port pin headers; if you need to use more serial ports, you may purchase them from Advantech.

1. 1701090401: 2.54 mm-pitch single- COM port cable kit for COM 2.

2.7 PS/2 Keyboard and Mouse Connector (KBMS1)

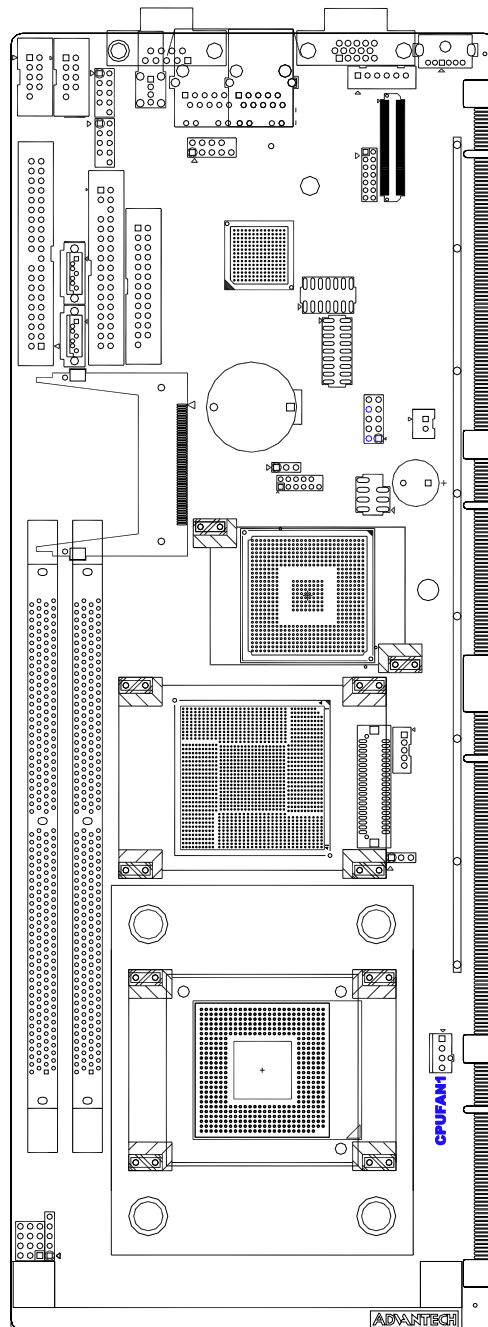


Two on-board 6-pin mini-DIN connectors (KBMS1) provide connections to PS/2 keyboard and mouse by the Y-cable (1700060202) in the package.

The on-board KBMS2 pin header provides connection for the chassis front panel PS/2 keyboard and mouse connector.

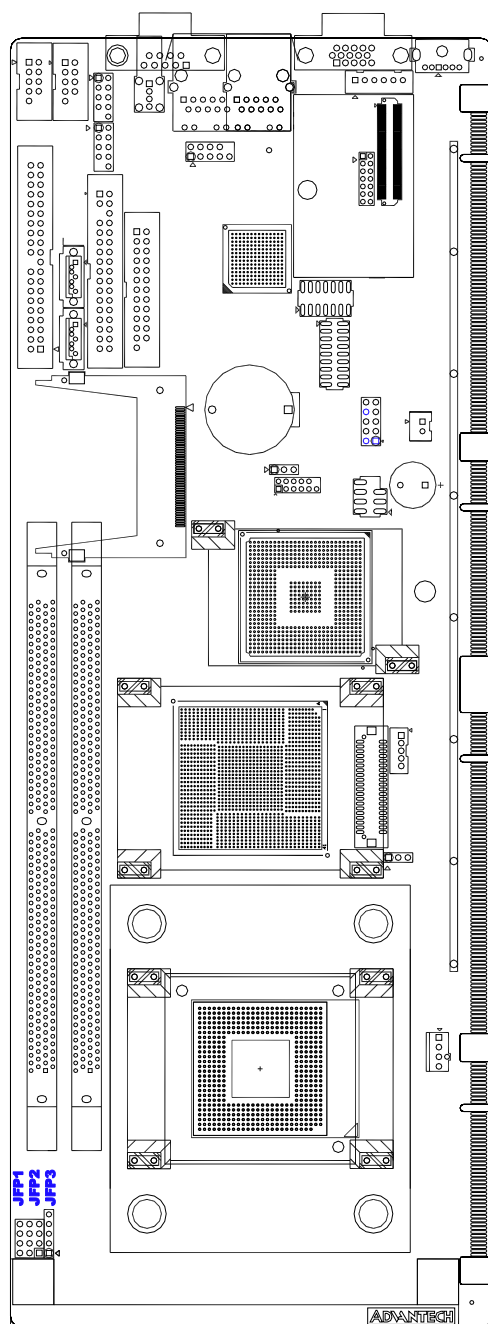
2.8 CPU Fan Connector (CPUFAN1)

This connector supports cooling fans of 500 mA (6 W) or less.



2.9 Front Panel Connectors (JFP1, JFP2 & JFP3)

There are several external switches to monitor and control the PCE-5130.



2.9.1 Power LED and keyboard lock (JFP3)

JFP3 is a 5-pin connector for the power LED. Refer to Appendix B for detailed information on the pin assignments. If a PS/2 or ATX power supply is used, the system's power LED status will be as indicated below:

Table 2.1: PS/2 or ATX power supply LED status

Power mode	LED (PS/2 power)	LED (ATX power)
System On	On	On
System Suspend	Fast flashes	Fast flashes
System Off	Off	Slow flashes

2.9.2 External speaker (JFP2)

JFP2 is a 4-pin connector for an external speaker. The PCE-5130 provides an onboard buzzer as an alternative to an external speaker. To enable the buzzer, set pins 5 and 7 as closed.



2.9.3 Reset connector (JFP1)

Many computer cases offer the convenience of a reset button. Connect the wire from the reset button.



2.9.4 HDD LED connector (JFP2)

You can connect an LED to connector JFP2 to indicate when the HDD is active.

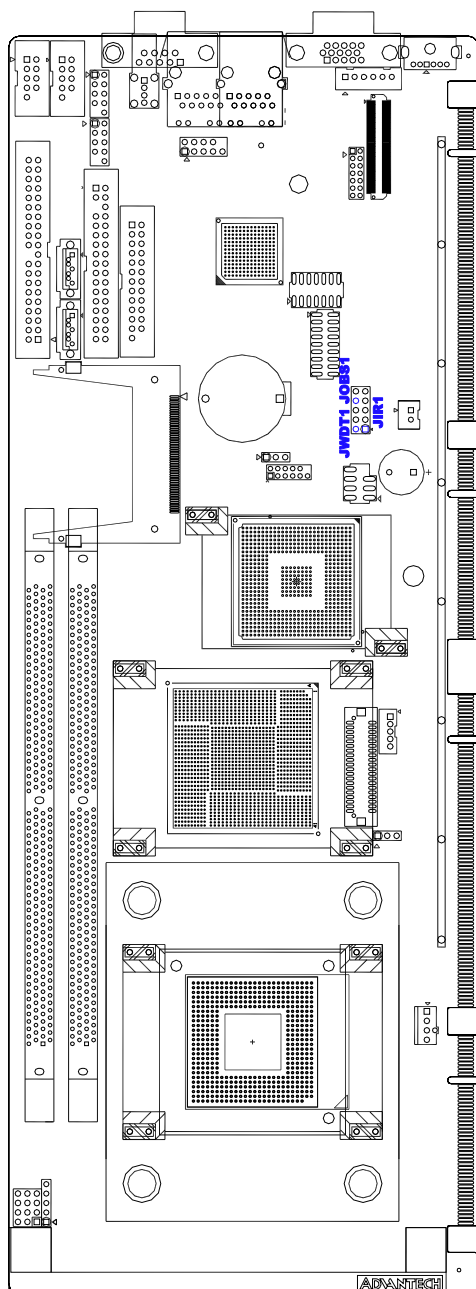


2.9.5 ATX soft power switch (JFP1)

If your computer case is equipped with an ATX power supply, you should connect the power on/off button on your computer case to JFP1. This connection enables the user to turn the computer on and off.



2.10 H/W Monitor Alarm (JOBS1)



Closed: Enable OBS Alarm

Open: Disable OBS Alarm

2.11 LAN Ports (LAN1 & LAN2)

The PCE-5130 is equipped with one or two high-performance 1000 Mbps Ethernet LANs. They are supported by all major network operating systems. The RJ-45 jacks on the rear plate provide convenient connectivity.

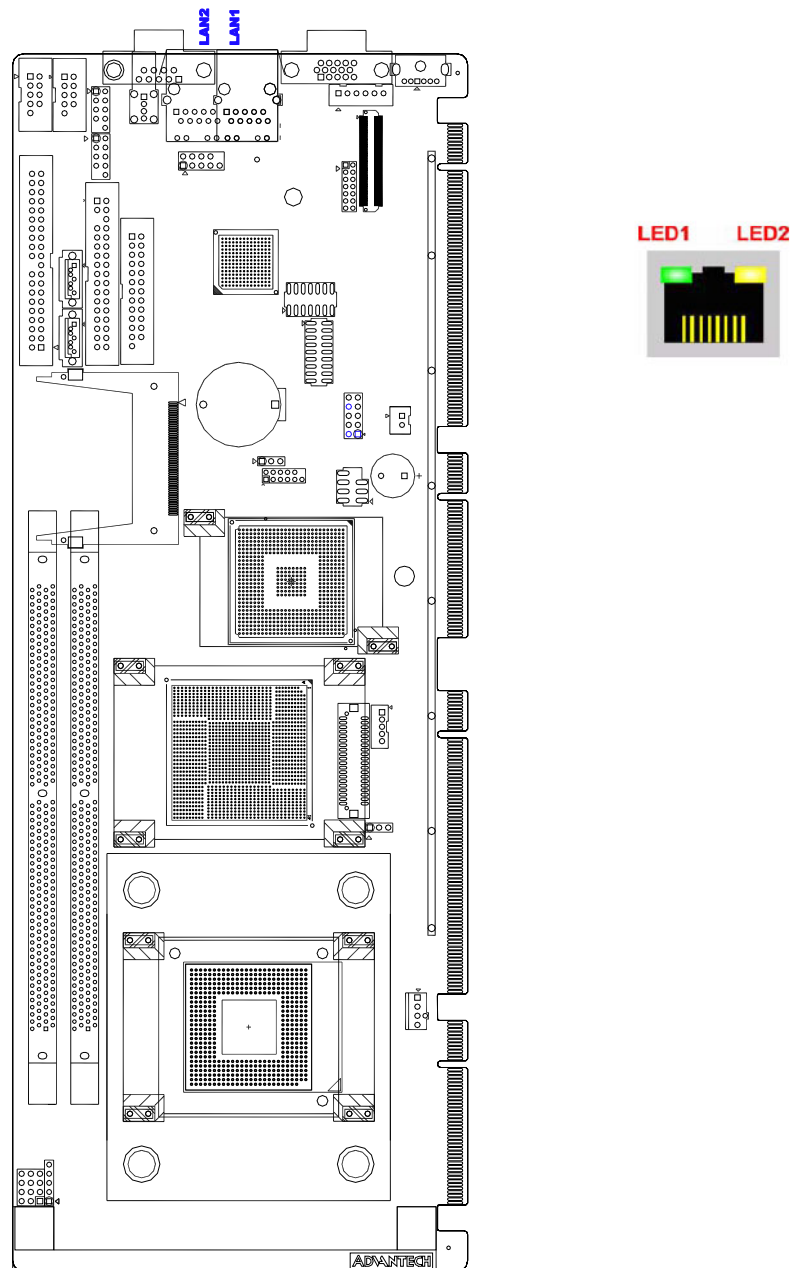
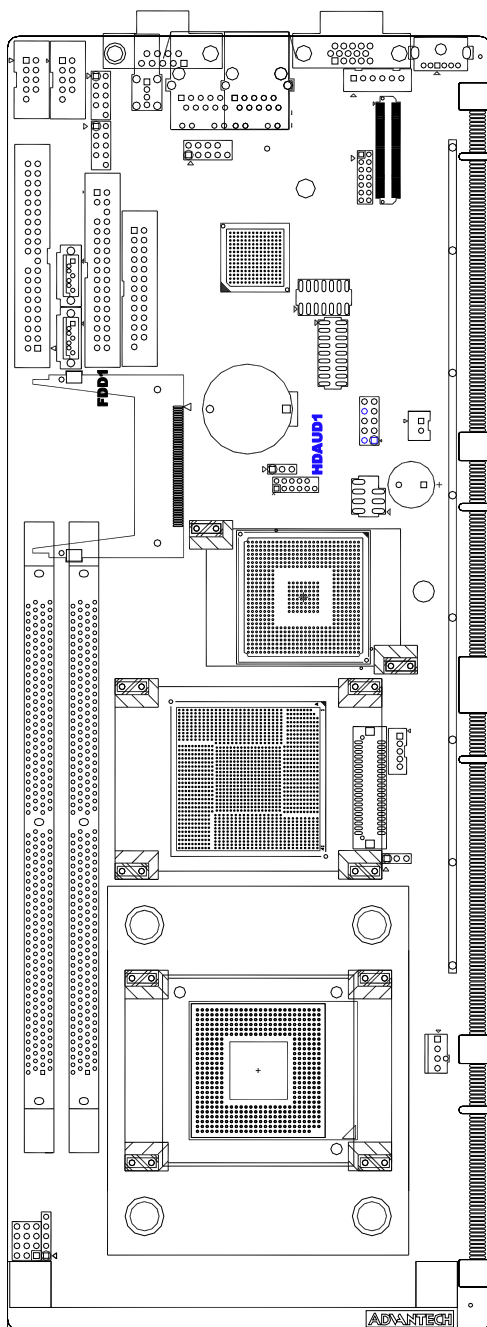


Table 2.2: LAN LED indicators

Lan Mode	LED1	LED2
1000 MGbps Link on	Green On	Yellow On
1000 Active	Green On	Yellow Flashes
1000 MGbps Link Off	Off	Off
100 MGbps Link on	Orange On	Yellow On
100 Active	Orange On	Yellow Flashes
100 MGbps Link Off	Off	Off
10 MGbps Link on	Off	Yellow On
10 Active	Off	Yellow Flashes
10 MGbps Link Off	Off	Off

2.12 High Definition Audio Module Interface

This HDAUD1 pin header is the connection interface to Advantech's 7.1 channel high definition audio module.

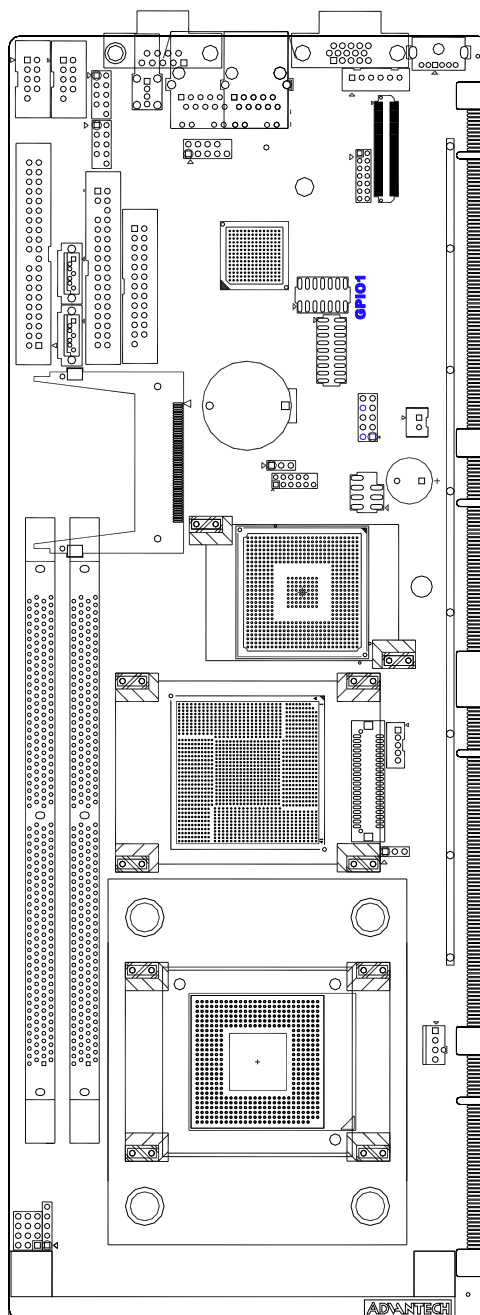


Note! Advantech 7.1 channel high definition audio module ordering information.



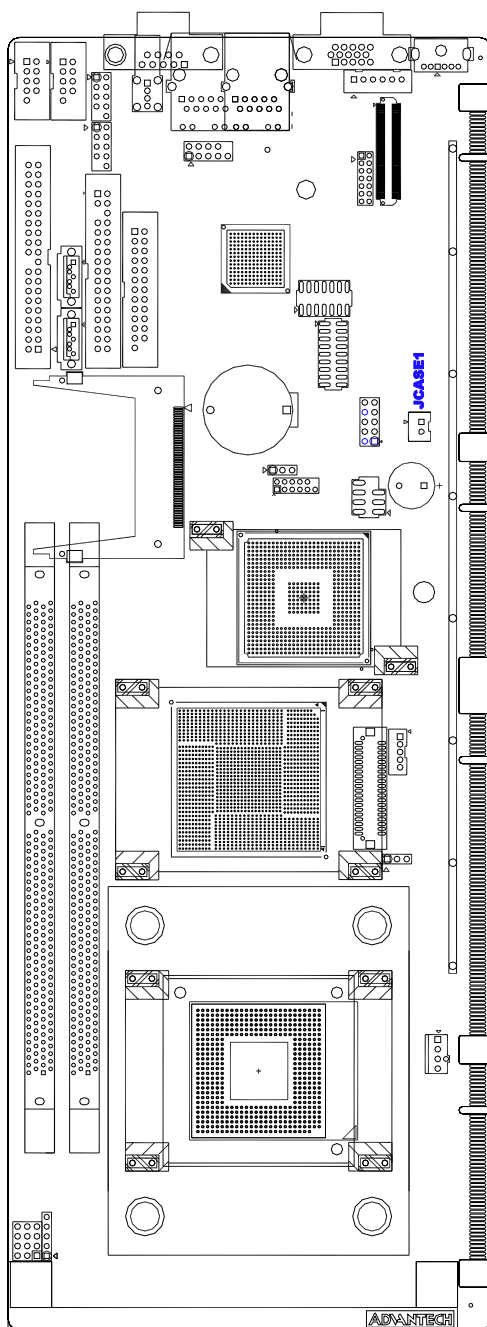
P/N: PCA-AUDIO-HDA1E

2.13 GPIO Header (GPIO1)



This is a 14-pin digital I/O header. Refer to Appendix B for detailed information on the pin assignments, and to Appendix C for the programming guide.

2.14 Case Open Connector (JCASE1)

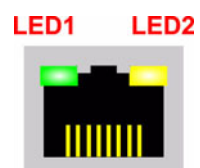
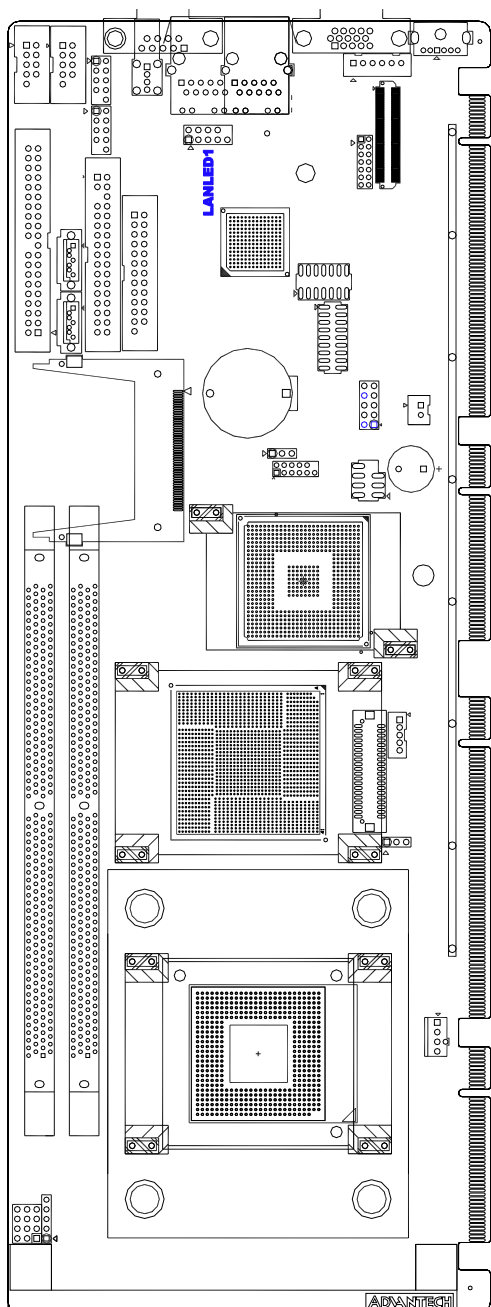


The 2-pin case open connector is for any chassis with a case open sensor. When the case is open, the buzzer on the motherboard will sound.

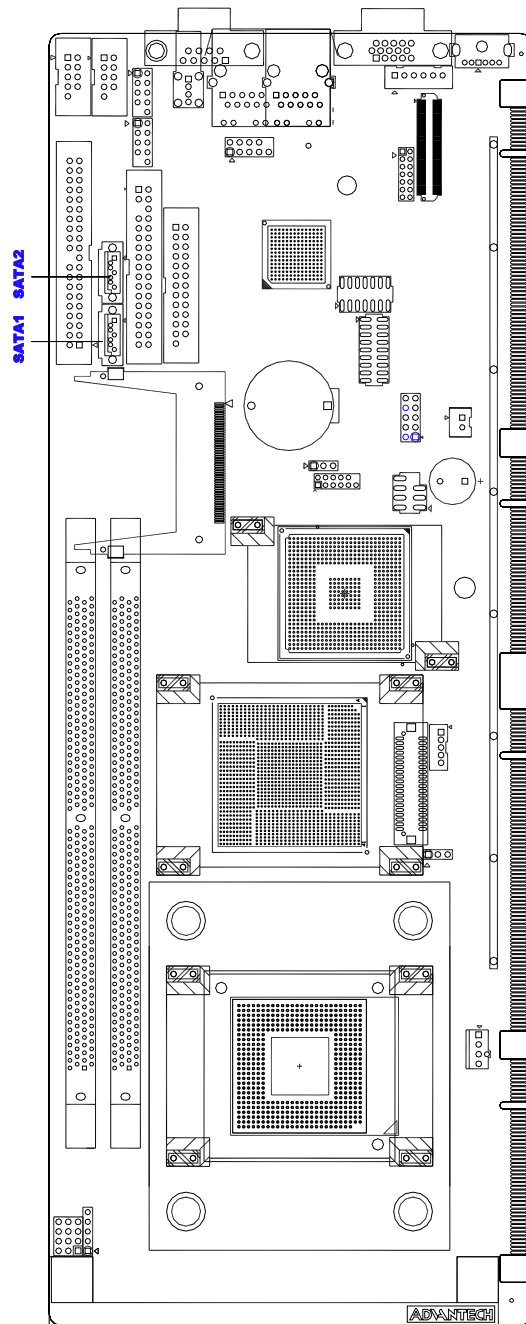
2.15 Front Panel LAN Indicator Connector (LANLED1)

Table 2.3: Front Panel LAN indicator connector

LAN Mode	LED1	LED2
1000Mbps Link on	Green, on	Yellow, on
1000Mbps Active	Green, on	Yellow, flashing
1000Mbps Link off	Off	Off
100Mbps Link on	Orange, on	Yellow, on
100Mbps Link active	Orange, on	Yellow, flashing
100Mbps Link off	Off	Off
10Mbps Link on	Off	Yellow, on
10Mbps Link active	Off	Yellow, flashing
10Mbps Link off	Off	Off



2.16 Serial ATA Interface (SATA1 ~ SATA2)



The PCE-5130 features high performance serial ATA interfaces (up to 150 MB/s); these long, thin cables ease cabling to hard drives or CD/DVD drives.

These two on-board SATA ports can be configured as RAID 0, or 1. Please see the detailed BIOS setting instructions for this in Chapter 3.

Chapter 3

Award BIOS Setup

3.1 Introduction

Award's BIOS ROM has a built-in setup program that allows users to modify the basic system configuration. This information is stored in battery backed-up memory (CMOS RAM) so that it retains the setup information when the power is off.

3.1.1 CMOS RAM Auto-backup and Restore

The CMOS RAM is powered by an onboard button cell battery. When you finish BIOS setup, the data in CMOS RAM will be automatically backed up to flash ROM. If operation in harsh industrial environments causes a soft error, BIOS will recheck the data in CMOS RAM and automatically restore the original data in flash ROM to CMOS RAM for booting.

Note! *If you intend to change the CMOS settings without restoring the previous backup, you have to click on "DEL" within two seconds of the "CMOS checksum error..." display screen message appearing. Then enter the "Setup" screen to modify the data. If the "CMOS checksum error..." message appears again and again, please check to see if you need to replace the battery in your system.*



3.2 Entering Setup

Turn on the computer and press to enter the BIOS setup.

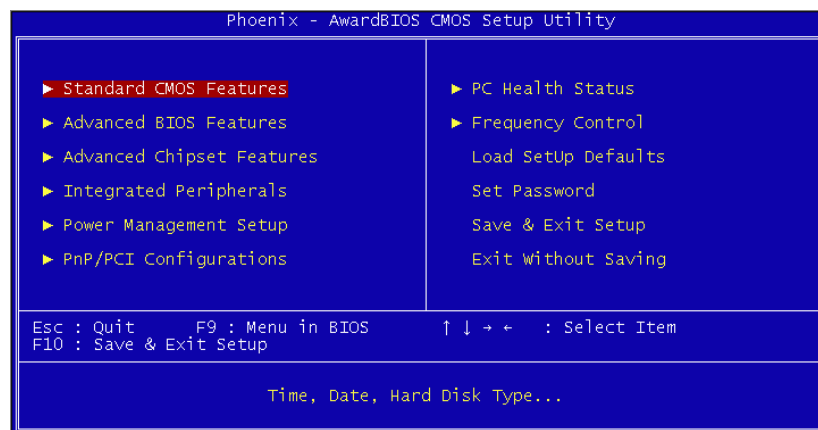


Figure 3.1 Award BIOS Setup initial screen

3.3 Standard CMOS Setup

- **Date**
The date format is <weekday>, <month>, <day>, <year>.
- **Time**
The time format is <hour> <minute> <second>, based on a 24-hour clock.
- **IDE channel 0/1 Master/Slave**
 - **IDE HDD Auto-Detection:** Press “Enter” to select this option for automatic device detection.
 - **IDE Device Setup:**
 - Auto:** Automatically detects IDE devices during POST
 - None:** Select this when no IDE device is used. The system will skip the auto-detection step to make system start up faster.
 - Manual:** User can manually input the correct settings.
 - **Access Mode:** The options are CHS/LBA/Large/Auto
 - **Capacity:** Capacity of currently installed hard disk.
 - **Cylinder:** Number of cylinders
 - **Head:** Number of heads
 - **Precomp:** Write precomp
 - **Landing Zone:** Landing zone
 - **Sector:** Number of sectors
- **Drive A / Drive B**
This category identifies the types of floppy disk drives installed in the system. The options are: None/360K, 5.25"/1.2M, 5.25"/720K, 3.5"/1.44M, 3.5"/2.88M, 3.5".
- **Halt On**
This category determines whether system start-up will halt or not when an error is detected during power up.
The options are: No Errors/All Errors/All, But Keyboard/All, But Diskette/All, But Disk/Key
- **Memory**
This category displays base memory, extended memory, and total memory detected during POST (Power On Self Test).

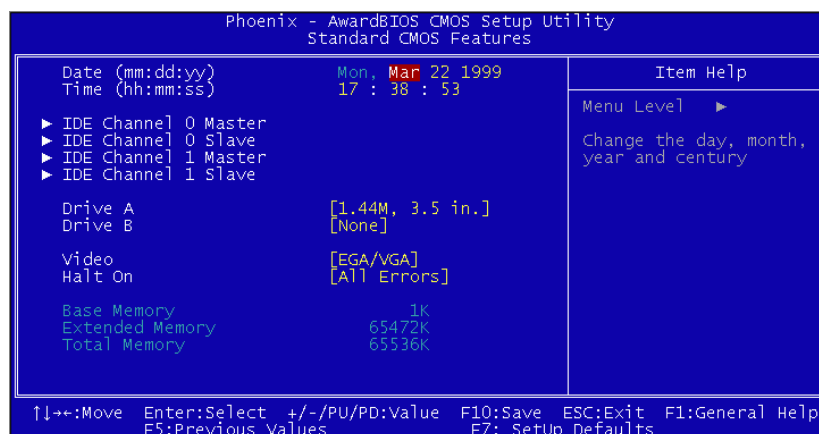


Figure 3.2 Standard CMOS Features Screen

3.4 Advanced BIOS Features

The “Advanced BIOS Features” screen appears when choosing the “Advanced BIOS Features” item from the “Initial Setup Screen” menu. It allows the user to configure the PCE-1530 according to his or her particular requirements. Below are some major items that are provided in the Advanced BIOS Features screen. A quick booting function is provided for your convenience. Simply enable the Quick Booting item to save yourself valuable time.

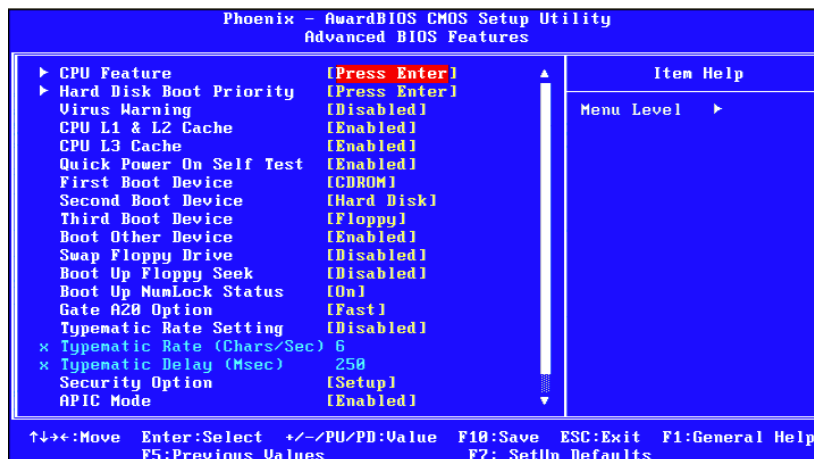


Figure 3.3 Advanced BIOS features screen (1)

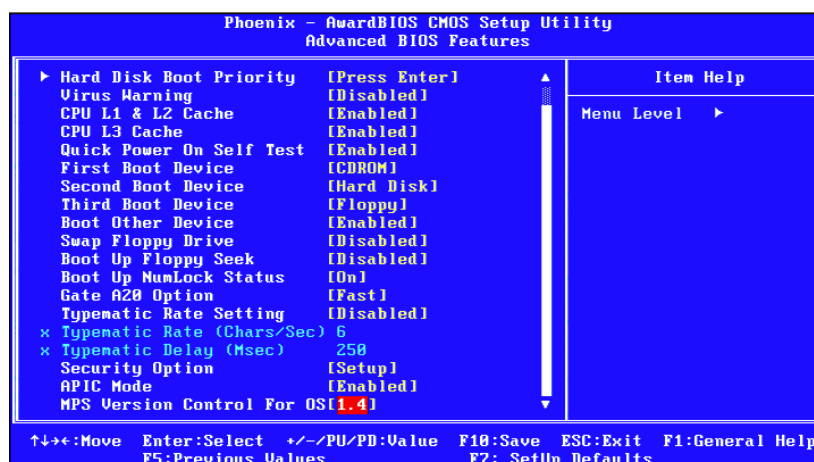


Figure 3.4 Advanced BIOS features screen (2)

■ CPU Features

– Delay Prior to thermal

This feature controls the activation of the Thermal Monitor's automatic mode. It allows you to determine when the Pentium 4's Thermal Monitor should be activated in automatic mode after the system boots. For example, with the default value of 16 Minutes, the BIOS activates the Thermal Monitor in automatic mode 16 minutes after the system starts booting up. The choices are 4 Min, 8 Min, 16 Min, and 32 Min.

– Limit CPUID MaxVal

Set Limit CPUID MaxVal to 3. This should be disabled for WinXP.

– Execute Disable Bit

When disabled, forces the XD feature flag to always return 0.

- **Hard Disk Boot Priority**
Set hard disk boot device priority.
- **Virus Warning**
Enables or disables the virus warning.
- **CPU L1, L2 & L3 Cache**
Enabling this feature speeds up memory access. The commands are “Enabled” or “Disabled.”
- **Quick Power On Self Test**
This allows the system to skip certain tests to speed up the boot-up procedure.
- **First/Second/Third Boot Device**
The BIOS tries to load the OS from the devices in the sequence set here. The options are: “Floppy”, “LS120”, “CDROM”, “Hard Disk”, “ZIP100”, “USB-FDD”, “USB-ZIP”, “USB-CDROM”, “LAN1”, “LAN2” and “Disabled”.
- **Boot Other Device**
Use this to boot another device. The options are “Enabled” and “Disabled”.
- **Swap Floppy Drive**
If the system has two floppy drives, choose “Enabled” to assign physical drive B to logical drive A and vice-versa. The commands are “Enabled” or “Disabled”.
- **Boot Up Floppy Seek**
Selection of the command “Disabled” will speed the boot up. Selection of “Enabled” searches disk drives during boot up.
- **Boot Up NumLock Status**
Sets the boot up status Num Lock. The options are “On” and “Off”.
- **Gate A20 Option**
“Normal”: A pin in the keyboard controller controls GateA20. Fast (Default) lets chipset control GateA20.
- **Typematic Rate Setting**
The typematic rate is the rate key strokes repeat as determined by the keyboard controller. The commands are “Enabled” or “Disabled”. Enabling allows the typematic rate and delay to be selected.
- **Typematic Rate (Chars/Sec)**
The BIOS accepts the following input values (characters/second) for auto repetition typematic rate: 6, 8, 10, 12, 15, 20, 24, and 30.
- **Typematic Delay (msec)**
Typematic delay is the time interval before auto repetition begins when the key is continuously depressed. The input values for this category are: 250, 500, 750, and 1000 (ms).
- **Security Option**
This category determines whether the password is required when the system boots up or only when entering setup. The options are:
 - **System:** The system will not boot, and access to Setup will be also denied unless the correct password is entered at the prompt.
 - **Setup:** The system will boot, but access to Setup will be denied unless the correct password is entered at the prompt.

Note! *To disable security, select PASSWORD SETTING in the main menu. Then, you will be asked to enter a password. Simply press <Enter> to disable security. When security is disabled, the system will boot and you can enter Setup freely.*



- **APIC Mode**

This setting allows you to enable the APIC mode. The choices are “Disabled” or “Enabled.”

- **MPS Version Control For OS**

This specifies the version of the Multiprocessor Specification (MPS) to be used. Version 1.4 has extended configuration tables to improve support for multiple PCI bus configurations and provide future expandability - use this for NT, and possibly Linux. It is also required for a secondary PCI bus to work without the need for a bridge. Leave it as 1.1 for older server Operating Systems.

3.5 Advanced Chipset Features

By choosing the “Advanced Chipset Features” option from the “Initial Setup Screen” menu, the screen below will be displayed. This sample screen contains the manufacturer’s default values for the PCE-1530, as shown in Figure 3-4:

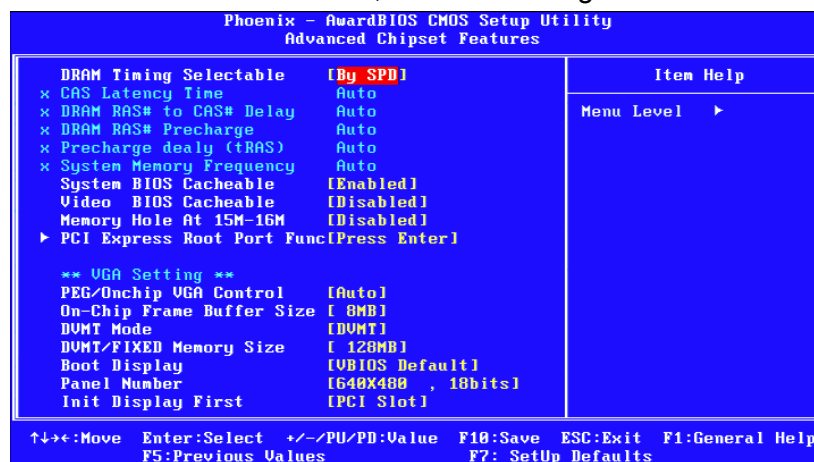


Figure 3.5 Advanced chipset features screen

Note! DRAM default timings have been carefully chosen and should ONLY be changed if data is being lost. Please first contact technical support.



- **DRAM Timing Selectable**

This item allows you to control the DRAM speed. The selections are “Manual” or “By SPD”.

- **CAS Latency Time**

When DRAM Timing Selectable is set to [Manual], this field is adjustable. This controls the CAS latency, which determines the time interval between SDRAM starting a read command and receiving it. The options are [3T], [4T], [5T], and [Auto].

- **DRAM RAS# to CAS# Delay**

When DRAM Timing selectable is set to [Manual], this field is adjustable. When DRAM is refreshed, the rows and columns are addressed separately. This setup item allows user to determine the timing of the transition from RAS (row address strobe) to CAS (column address strobe). The less the clock cycles are, the faster the DRAM speed is. Setting options are [2T] to [5T], and [Auto].

- **DRAM RAS# Precharge**
When the DRAM Timing Selectable is set to [Manual], this field is adjustable. This setting controls the number of cycles for Row Address Strobe (RAS) to be allowed to precharge. If no sufficient time is allowed for the RAS to accumulate its charge before DRAM refresh, refreshing may be incomplete and DRAM may fail to retain data. This item applies only when synchronous DRAM is installed in the system. Setting options are [2T] to [5T], and [Auto].
- **Precharge Delay (t RAS)**
This item allows you to select the value in this field, depending on whether the board has paged DRAMs or EDO (extended data output) DRAMs. The choices are: "4" to "15" and "Auto".
- **System Memory Frequency**
To adjust the frequency of memory. The choices are: "533MHz", "667MHz" and "Auto".
- **System BIOS Cacheable**
Selecting "Enabled" allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes data to this memory area, a system error may occur. The Choices are "Enabled", and "Disabled".
- **Video BIOS Cacheable**
Selecting "Enabled" allows caching of the video BIOS, resulting in better system performance. However, if any program writes to this memory area, a system error may occur. The choices are "Enabled", and "Disabled".
- **Memory Hole At 15M-16M**
Enabling this feature reserves 15 MB to 16 MB memory address space for ISA expansion cards that specifically require this setting. This makes memory from 15 MB and up unavailable to the system. Expansion cards can only access memory up to 16 MB. The default setting is "Disabled".
- **PCI-Express Root Port Func**
 - **PCI Express Port 1/2/3/4**
The default setting is "Auto." The choices are "Enabled," "Disabled," and "Auto."
 - **PCI-E Compliancy Mode**
This allows the user to select the PCI-E compliant mode. The options are [v1.0], and [v1.0a].
- **PEG / Onchip VGA Control**
Use this field to select PEG or Onchip VGA. The default is AUTO.
- **PEG Force X1**
Use this field to select the PEG Force X1. The default is disabled.
- **On-Chip Video Memory Size**
Use this field to select the On-Chip Frame Buffer Size, Fixed Memory Size and DVMT Memory Size. The total graphics memory can be up to 128 MB.
- **On-Chip Frame Buffer Size**
The On-Chip Frame Buffer Size can be set to 1 MB or 8 MB. This memory is shared with the system memory.
- **DVMT Mode**
Displays the active system memory mode.
- **DVMT / FIXED Memory Size**
Specify the size of DVMT / FIXED system memory to allocate for video memory.

- **Boot Display**
Choose the boot display device. The default setting is "Auto". The choices are "VBIOS Default", "CRT", "LFP" and "LFP+CRT".
- **Panel Number**
These fields allow you to select the LCD Panel type. The default values for these ports are:
 - 640x480, 18bit SC
 - 800x600, 18bit SC
 - 1024x768, 18bit SC
 - 1028x1024, 18bit DC
- **Init Display First**
Choose the first display interface to initiate while booting. The choice is "PCI Slot" or "Onboard".

3.6 Integrated Peripherals

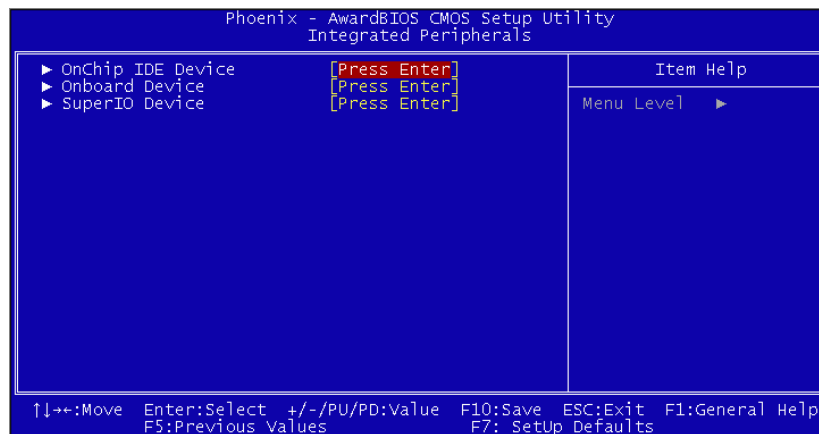


Figure 3.6 Integrated peripherals

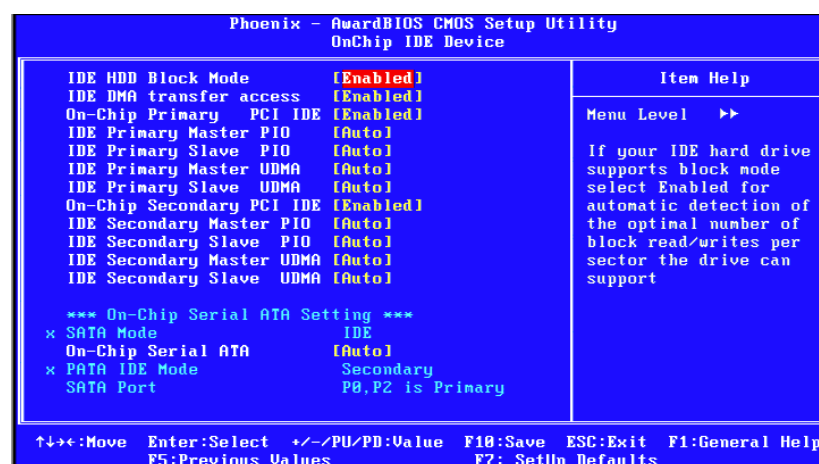


Figure 3.7 On-Chip IDE Device

■ IDE HDD Block Mode

If your IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support.

■ IDE DMA Transfer Access


Use this field to enable or disable IDE DMA transfer access.

■ On-Chip Primary / Secondary IDE Device

IDE Primary Master/Slave PIO/UDMA Mode (Auto). The channel has both a master and a slave, making four IDE devices possible. Because two IDE devices may have a different Mode timing (0, 1, 2, 3, 4), it is necessary for these to be independent. The default setting "Auto" will allow auto detection to ensure optimal performance.

■ SATA Mode

The setting choices for the SATA Mode are IDE, RAID and AHCI Mode. Select [IDE] if you want to have SATA function as IDE. Select [AHCI] for Advanced Host Controller Interface (AHCI) feature, with improved SATA performance and native command queuing. Select [RAID] to use SATA for RAID.

Note!  Please refer to the PDF-format Intel(R) Matrix Storage Technology Quickstart Guide and Intel(R) Matrix Storage Manager User's Manual on the CD (in the MANUAL folder) to know the necessary steps to build and configure your RAID 0, 1 system using Intel(R) Matrix Storage Technology and Matrix Storage Manager.

■ On-Chip Serial ATA

Choose the status of serial ATA. The default setting is "Auto" which lets the system arrange all parallel and serial ATA resources automatically. The "Disabled" setting disables the SATA controller. The "Combined Mode" combines PATA and SATA, and maximum of 2 IDE drives in each channel. The "Enhanced Mode" enables both SATA and PATA, and a maximum of 6 IDE drives are supported. The "SATA Only" setting means SATA is operating in legacy mode.

■ PATA IDE Mode

This item shows the parallel ATA channel. It is Secondary.

■ SATA Port

The PATA IDE mode must to be set to Secondary and SATA will display "P0, P2 is Primary". It means SATA0 and SATA2 act as Primary Channel. We have one configuration with this setting by spec, and can't swap the channel.

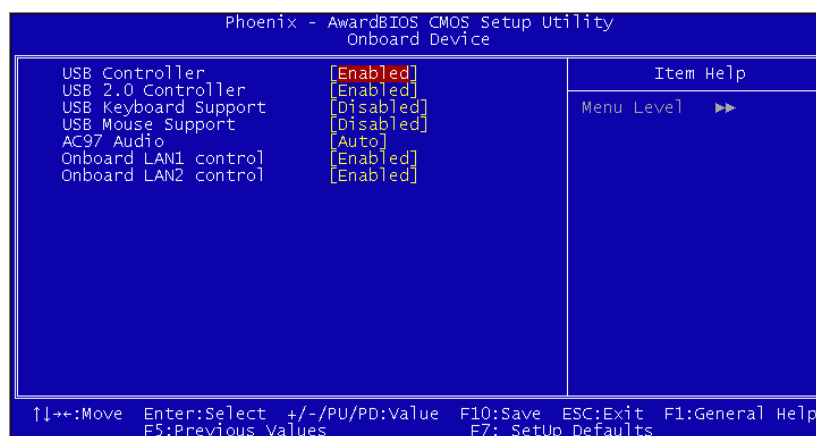


Figure 3.8 Onboard Device

- **USB Controller**

Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have USB peripherals. The choices are “Enabled” and “Disabled”.

- **USB 2.0 Controller**

This entry is to disable/enable the USB 2.0 controller only. The BIOS itself may/may not have high-speed USB support. If the BIOS has high speed USB support built in, the support will automatically turn on when a high speed device is attached. The choices are “Enabled” or “Disabled”.

- **USB Keyboard / Mouse Support**

Select Enabled if you plan to use an USB keyboard. The choices are “Enabled” and “Disabled”.

- **AC97 Audio**

Select “Disable” if you do not want to use AC97 audio. Options are “Auto”, and “Disabled”.

- **Onboard LAN1 Control**

Options are “Enabled” and “Disabled”. Select “Disabled” if you don’t want to use onboard LAN controller1.

- **Onboard LAN2 Control**

Options are “Enabled” and “Disabled”. Select Disabled if you don’t want to use the onboard LAN controller2.

Note: Correct sequence of onboard Lan controllers(Lan1 & Lan2) shows in the “Onboard Device” BIOS view.

Note! *DRAM default timings have been carefully chosen and should ONLY be changed if data is being lost. Please first contact technical support.*

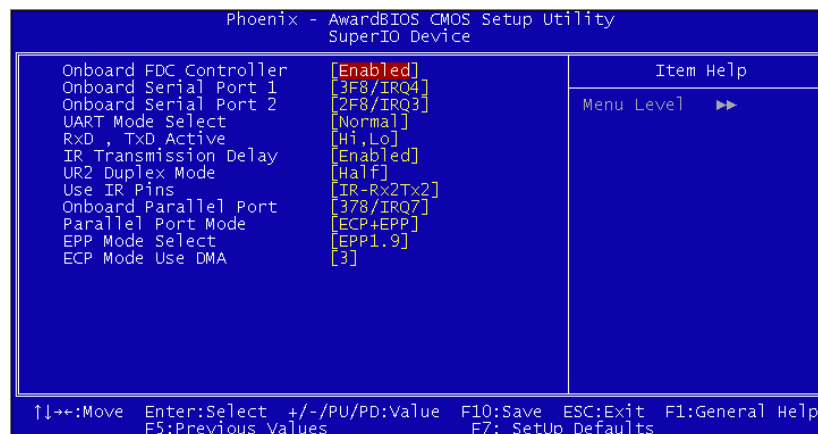


Figure 3.9 Super I/O Device

- **Onboard FDC Controller**

When enabled, this field allows you to connect your floppy disk drives to the onboard floppy disk drive connector instead of a separate controller card. If you want to use a different controller card to connect the floppy disk drives, set this field to Disabled.

- **Onboard Serial Port 1**

The settings are “3F8/IRQ4”, “2F8/IRQ3”, “3E8/IRQ4”, “2E8/IRQ3”, and “Disabled” for the on-board serial connector.

- **Onboard Serial Port 2**
The settings are “3F8/IRQ4”, “2F8/IRQ3”, “3E8/IRQ4”, “2E8/IRQ3”, and “Disabled” for the on-board serial connector.
- **UART Mode Select**
This item allows you to select UART mode. The choices: “IrDA”, “ASKIR”, and “Normal”.
- **RxD, TxD Active**
This item allows you to determine the active level of the RxD and TxD serial lines. The Choices: “Hi, Hi”, “Lo, Lo”, “Lo, Hi”, and “Hi, Lo”.
- **IR Transmission Delay**
This item allows you to enable/disable IR transmission delay. The choices are “Enabled” and “Disabled”.
- **UR2 Duplex Mode**
This item allows you to select the IR half/full duplex function. The choices are “Half” and “Full”.
- **Use IR Pins**
The choices are “RxD2, TxD2” and “IR-Rx2Tx2”.
- **Onboard Parallel Port**
This field sets the address of the on-board parallel port connector. You can select “378/IRQ7”, “278/IRQ5”, “3BC/IRQ7”, or “Disabled”. If you install an I/O card with a parallel port, make sure there is no conflict in the address assignments. The single board computer can support up to three parallel ports.
- **Parallel Port Mode**
This field allows you to set the operation mode of the parallel port. The setting “Normal” allows normal speed operation, but in one direction only. “EPP” allows bidirectional parallel port operation at maximum speed. “ECP” allows the parallel port to operate in bidirectional mode and at a speed faster than the maximum data transfer rate. “ECP + EPP” allows normal speed operation in a two-way mode.
- **EPP Mode Select**
This field allows you to select EPP port type 1.7 or 1.9. The choices are “EPP1.9” and “EPP1.7”.
- **ECP Mode Use DMA**
This selection is available only if you select “ECP” or “ECP + EPP” in the Parallel Port Mode field. In ECP Mode, you can select DMA channel 1 or DMA channel 3. Leave this field on the default setting.

3.7 Power Management Setup

The power management setup controls the single board computer's "green" features to save power. The following screen shows the manufacturer's defaults.

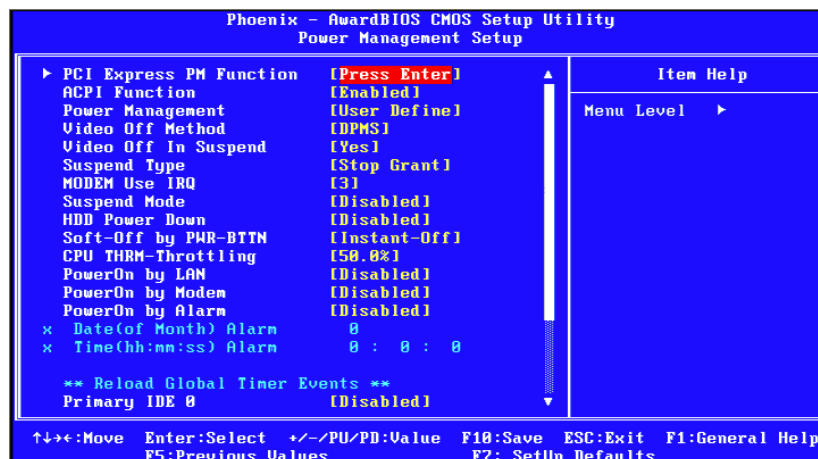


Figure 3.10 Power management setup screen (1)

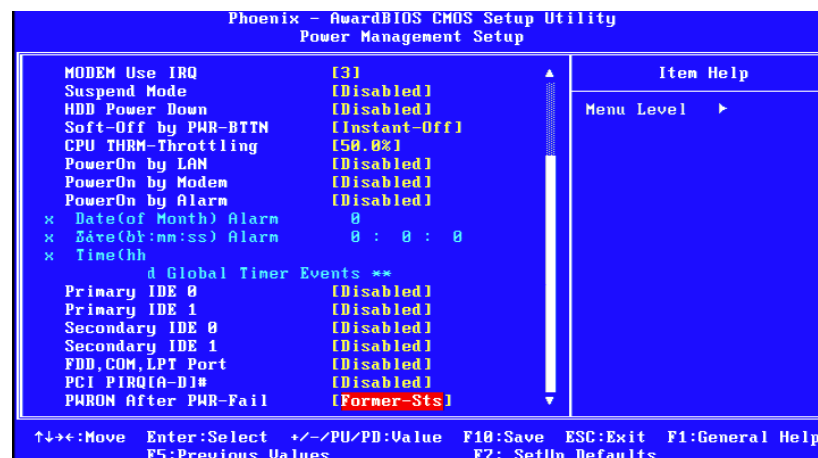


Figure 3.11 Power management setup screen (2)

■ PCI Express PM Function

This allow you to control Power On by onboard LAN chip feature.

■ ACPI Function

The choices are: "Enabled" and "Disabled".Power Management

This category allows you to select the type (or degree) of power saving and is directly related to the following modes:

- HDD Power Down
- Suspend Mode

There are three selections for Power Management, and they have fixed mode settings.

Table 3.1: Power Saving

Saving Mode	Function
Min Saving	Minimum power management., Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max Saving	Maximum power management., Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Defined (Default)	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min., and disabled.

■ **Video Off Method**

Use this to select the method to turn off the video. The choices are “Blank Screen”, “V/H SYNC+ Blank”, and “DPMS”.

■ **Video Off In Suspend**

When the system is in suspend mode, the video will turn off. The choices are “No” and “Yes”.

■ **Suspend Type**

The choices are “Stop Grant” and “PwrOn Suspend”.

■ **Modem Use IRQ**

This determines the IRQ that the MODEM can use. The choices are “3”, “4”, “5”, “7”, “9”, “10”, “11”, and “NA”.

■ **Suspend Mode**

Please refer to 3.7.3

■ **HDD Power Down**

Please refer to 3.7.3

■ **Soft-Off by PWR-BTTN**

If you choose “Instant-Off”, then pushing the ATX soft power switch button once will switch the system to “system off” power mode. You can choose “Delay 4 sec”. If you do, then pushing the button for more than 4 seconds will turn off the system, whereas pushing the button momentarily (for less than 4 seconds) will switch the system to “suspend” mode.

■ **PowerOn by LAN**

This item allows you to power on the system by LAN. The choices are “Enabled” and “Disabled”.

■ **CPU THRM-Throttling**

This option controls the CPU speed as a percentage of regular power. the choices are 87.5%, 75%, 62.5%, 50%, 37.5%, 25%, 12% and 12.5%.

■ **PowerOn by Modem**

To enabled or disable the function to power on the system via a Modem connection from a remote host. The choice “Enabled” and “Disabled”.

■ **PowerOn by Alarm**

The choices are “Enabled” and “Disabled”. Fields that follow below indicate date of current month and time of alarm settings, if enabled.

■ **Primary IDE 0 (1) and Secondary IDE 0 (1)**

When Enabled, the system will resume from suspend mode if Primary IDE 0 (1) or Secondary IDE 0 (1) becomes active. The choices are “Enabled” and “Disabled”.

- **FDD, COM, LPT PORT**

When Enabled, the system will resume from suspend mode if the FDD, interface, COM port, or LPT port is active. The choices are “Enabled” and “Disabled”.

- **PCI PIRQ [A-D]#**

When Enabled, the system resumes from suspend mode if an interrupt occurs. The choices are “Enabled” and “Disabled”.

- **PWRON After PWR-Fail**

Use this to set up the system after power failure. The “Off” setting keeps the system powered off after power failure, the “On” setting boots up the system after failure, and the “Former-Sts” returns the system to the status before power failure.

3.8 PnP/PCI Configurations

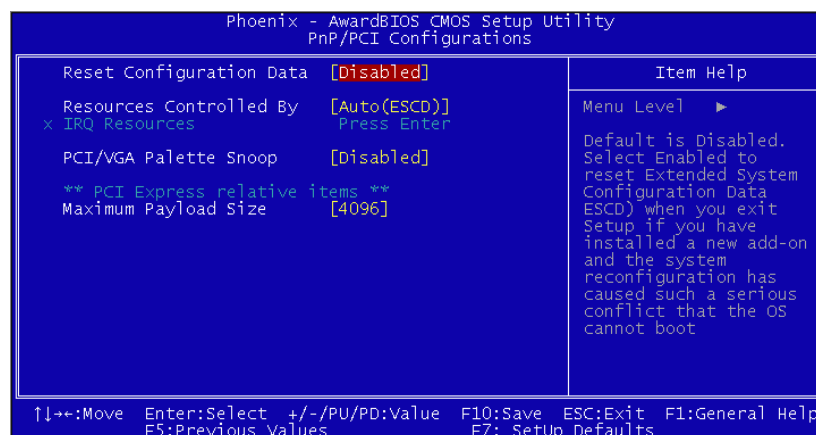


Figure 3.12 PnP/PCI configurations screen

- **Reset Configuration Data**

The default is Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) if you have installed a new add-on card, and system configuration is in such a state that the OS cannot boot.

- **Resources Controlled By**

The commands here are “Auto(ESCD)” or “Manual”. Choosing “Manual” requires you to choose resources from the following sub-menu. “Auto(ESCD)” automatically configures all of the boot and Plug and Play devices, but you must be using Windows 95 or above.

- **PCI / VGA Palette Snoop**

This is set to “Disabled” by default.

- **Maximum Payload Size**

This allows you to set the maximum TLP payload size for PCI Express devices. The options are [128 bytes], [256 bytes], [512 bytes], [1024 bytes], [2048 bytes], and [4096 bytes].

3.9 PC Health Status

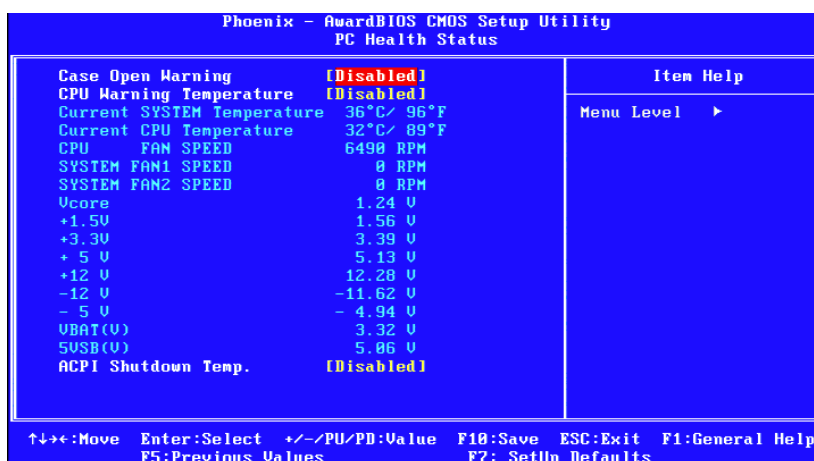


Figure 3.13 PC Health Status Screen

- **Case Open Warning**
Enable this to detect if the case is open or closed.
- **CPU Warning Temperature**
This item will prevent the CPU from overheating. The choices are “Disabled”, “60C/140F”, “63C/145F”, “66C/151F”, “70C/158F”, “75C/167F”, “80C/176F”, “85C/185F”, “90C/194F”, and “95C/205F”.
- **Current System Temperature**
This shows you the current temperature of system.
- **Current CPU Temperature**
This shows the current CPU temperature.
- **CPU FAN Speed**
This shows the current CPU FAN operating speed.
- **System FAN 1 / 2 Speed**
This shows the current operating speed of the system fans.
- **VCORE and Other Voltages**
This shows the voltage of VCORE, +1.5V, +3.3, +5V, +12V, -12V, -5V, VBAT(V), and 5VSB(V).
- **ACPI Shutdown Temperature**
The system will shut down automatically when the CPU temperature is over the selected setting. This function can prevent CPU damage caused by overheating.

3.10 Frequency / Voltage Control

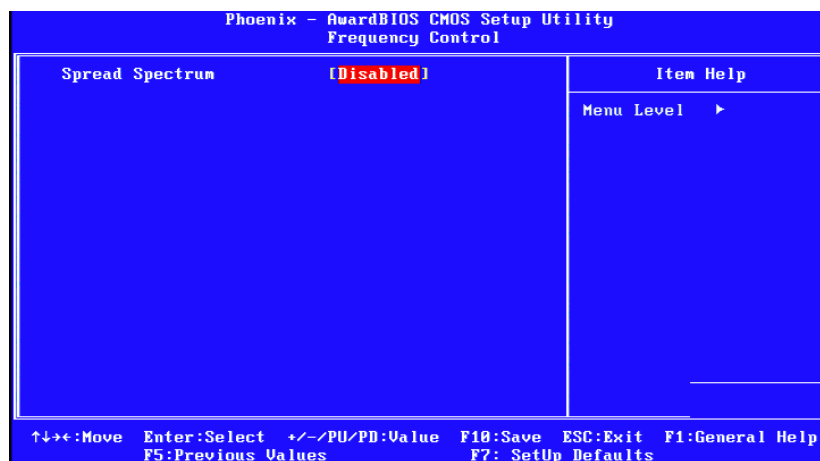


Figure 3.14 Spread Spectrum Control screen

■ Spread Spectrum

This setting allows you to reduce EMI by modulating the signals the CPU generates so that the spikes are reduced to flatter curves. This is achieved by varying the frequency slightly so that the signal does not use any particular frequency for more than a moment. The choices are “Disabled” and “Enabled”.

3.11 Password Setting

Follow these steps to change the password.

1. Choose the "Set Password" option from the "Initial Setup Screen" menu and press <Enter>. The screen displays the following message:

Please Enter Your Password

2. Press <Enter>.
3. If the CMOS is good and this option has been used to change the default password, the user is asked for the password stored in the CMOS. The screen displays the following message:

Please Confirm Your Password

4. Type the current password and press <Enter>.
5. After pressing <Enter> (ROM password) or the current password (user-defined), you can change the password stored in the CMOS. The password must be no longer than eight (8) characters.

Remember, to enable the password setting feature, you must first select either "Setup" or "System" from the "Advanced BIOS Features" menu.

3.12 Save & Exit Setup

If you select this and press <Enter>, the values entered in the setup utilities will be recorded in the CMOS memory of the chipset. The processor will check this every time you turn your system on and compare this to what it finds as it checks the system. This record is required for the system to operate.

3.13 Exit Without Saving

Selecting this option and pressing <Enter> lets you exit the setup program without recording any new values or changing old ones.

Chapter 4

Chipset Software
Installation Utility

4.1 Before you Begin

To facilitate the installation of the enhanced display drivers and utility software, read the instructions in this chapter carefully. The drivers for the PCE-3132 are located on the software installation CD. The Intel Chipset Software Installation Utility is not required on any systems running Windows NT 4.0. Updates are provided via Service Packs from Microsoft.

Note! *The files on the software installation CD are compressed. Do not attempt to install the drivers by copying the files manually. You must use the supplied SETUP program to install the drivers.*



Before you begin, it is important to note that most display drivers need to have the relevant software application already installed in the system prior to installing the enhanced display drivers. In addition, many of the installation procedures assume that you are familiar with both the relevant software applications and operating system commands. Review the relevant operating system commands and the pertinent sections of your application software's user manual before performing the installation.

4.2 Introduction

The Intel Chipset Software Installation (CSI) utility installs the Windows INF files that outline to the operating system how the chipset components will be configured. This is needed for the proper functioning of the following features:

- Core PCI PnP services
- IDE Ultra ATA 100/66/33 and Serial ATA interface support
- USB 1.1/2.0 support (USB 2.0 driver needs to be installed separately for Win98)
- Identification of Intel. chipset components in the Device Manager
- Integrates superior video features. These include filtered sealing of 720 pixel DVD content, and MPEG-2 motion compensation for software DVD

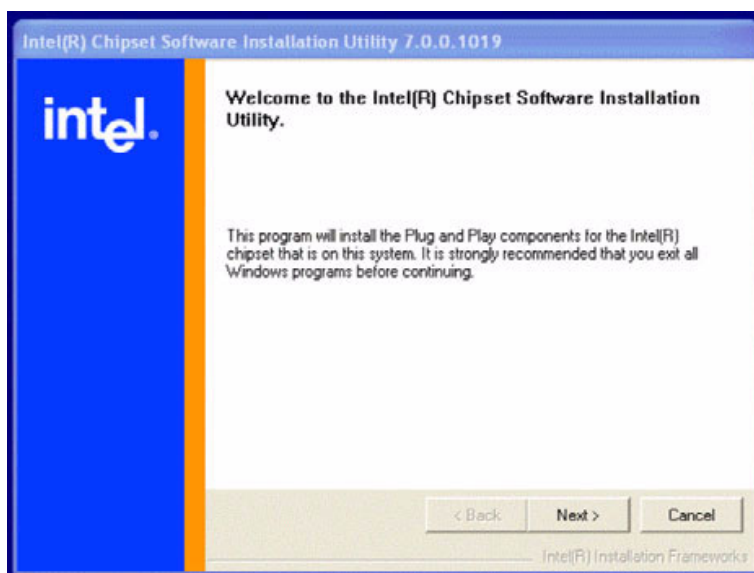
Note! *This utility is used for the following versions of Windows, and it has to be installed before installing all the other drivers:*



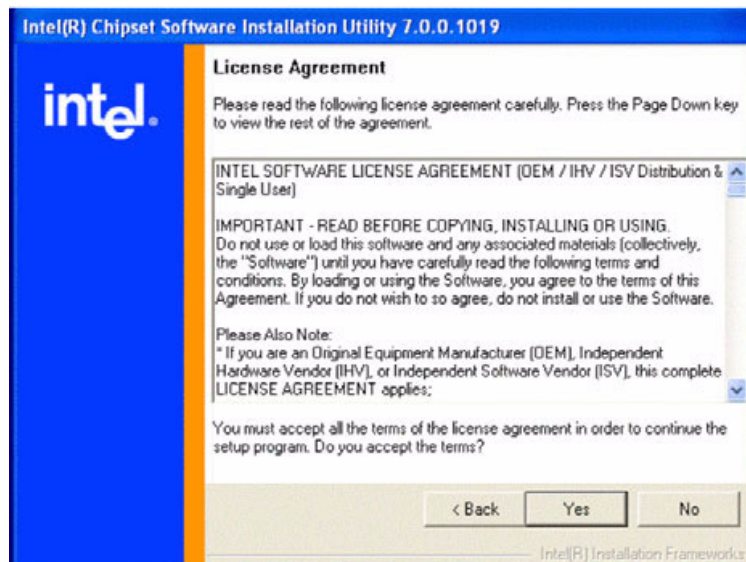
- Windows 2000
- Windows XP

4.3 Windows XP Driver Setup

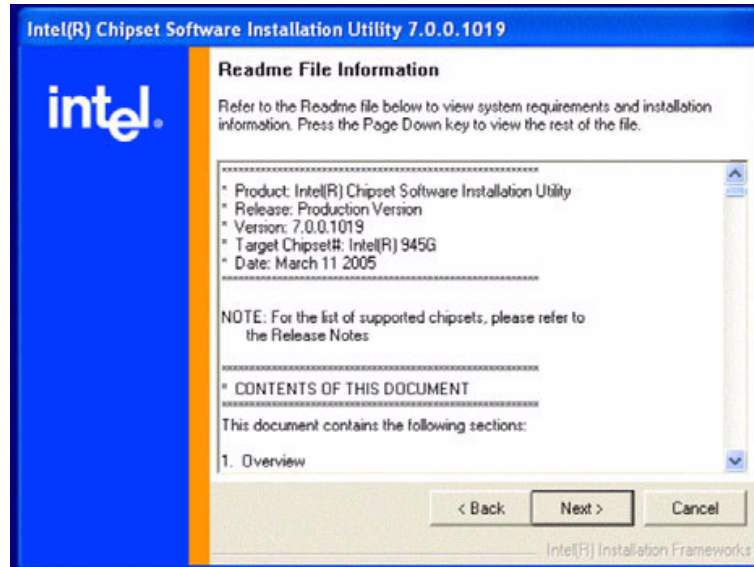
1. Insert the driver CD into your system's CD-ROM drive. Select the folder "Intel INF" then click "infinst_autol.exe". A message pops up telling you to install the CSI utility before other device drivers. Windows XP is used as an example in the following steps.
2. Click "Next" when you see the following message.



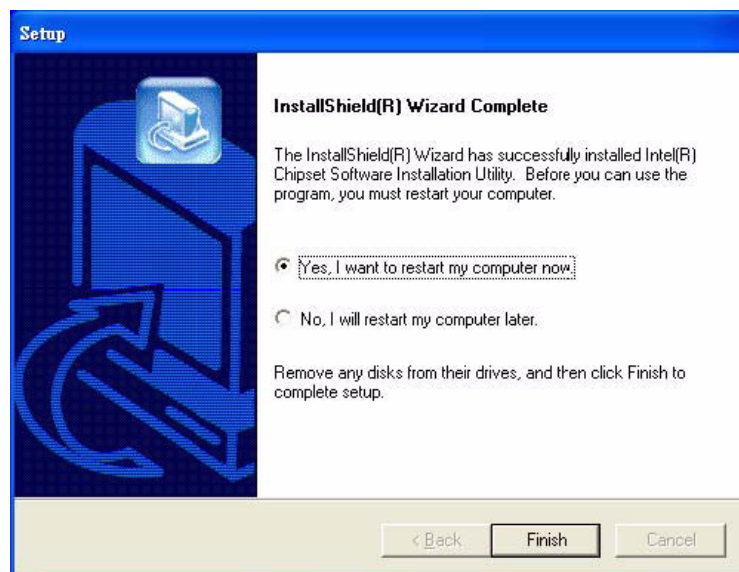
3. Click "Yes" when you see the following message.



4. Click “Next” when you see the following message.



5. When the following message appears, click “Finish” to complete the installation and restart Windows.



Chapter 5

VGA Setup

5.1 Introduction

The Intel 945GME integrated graphics controller provides an analog VGA port, and one digital LVDS interface. You need to install the graphic driver to enable the function.

The Intel 945GME integrated graphics controller includes the following features.

- **Intel Graphics Media Accelerator 950:** Incorporating the latest Microsoft® DirectX®9 support capabilities, it allows software developers to create lifelike environments and characters. Dual independent display, enhanced display modes for widescreen flat panels, and optimized 3D support deliver an intense and realistic visual experience without requiring a separate graphics card.
- **Intel Dynamic Video Memory Technology (DVMT3.0):** PCE-5130 handles diverse applications by providing the maximum availability of system memory for general computer usage, and supplying additional graphics memory when a 3D-intensive application requests it. DVMT balances memory allocation between applications and video, assuring optimum efficiency.
- **LVDS Interface:** PCE-5130 provides an 18-bit dual channel LVDS interface supporting up to WUXGA(1600X1200) panel resolution.

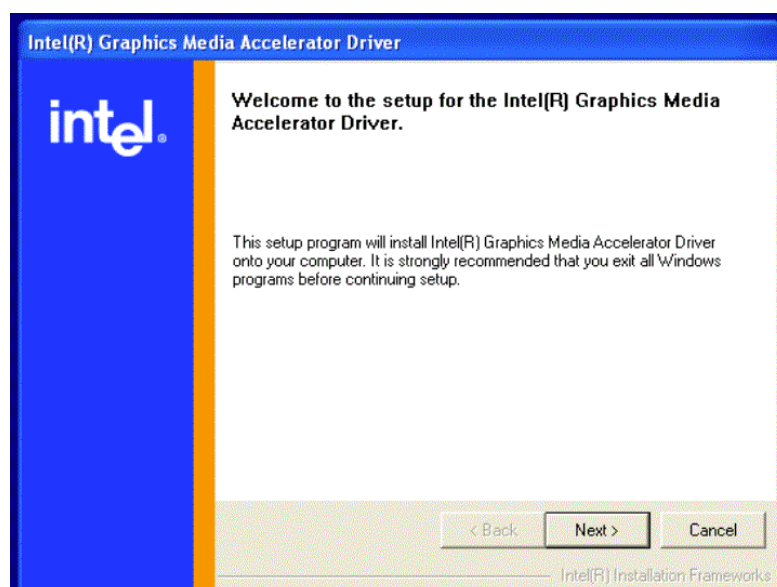
5.2 Windows XP Driver Setup

Note! Before installing this driver, make sure the CSI utility has been installed in your system. See Chapter 4 for information on installing the CSI utility.

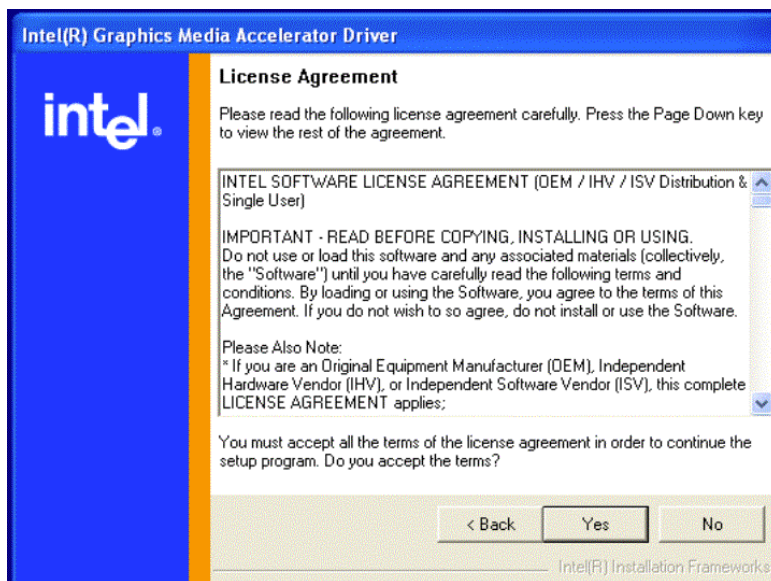


Insert the driver CD into your system's CD-ROM drive. Select the "VGA" folder then click the proper VGA driver for the OS. Windows XP is used as an example in the following steps.

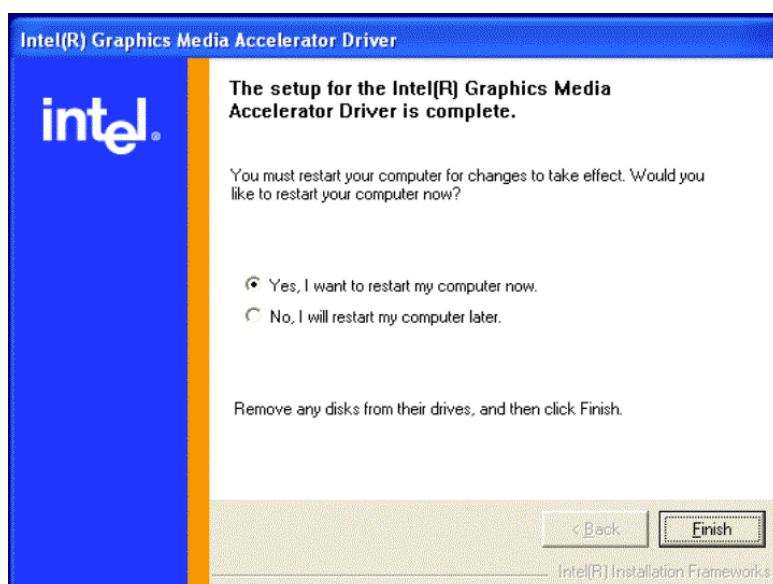
1. Click "Next" to continue the installation.



2. You will see a welcome window. Please click “Yes” to continue the installation.



3. Elect to restart the computer now or later, and click “Finish” to complete the installation.



Chapter 6

LAN Configuration

6.1 Introduction

The PCE-5130 has a single/dual Gigabit Ethernet LAN via dedicated PCI Express x1 bus (Intel® 82573/82574), which offers bandwidth of up to 500 MB/sec, eliminating the bottleneck of network data flow and incorporating Gigabit Ethernet to operate at 1000 Mbps.

6.2 Features

- Integrated 10/100/100 Mbps transceiver
- 10/100/1000 Mbps triple-speed MAC
- High-speed RISC core with 24-KB cache
- On-chip voltage regulation
- Wake-on-LAN (WOL) support
- PCI Express X1 host interface

6.3 Installation

Note! *Before installing the LAN drivers, make sure the CSI utility has been installed on your system. See Chapter 4 for information on installing the CSI utility.*



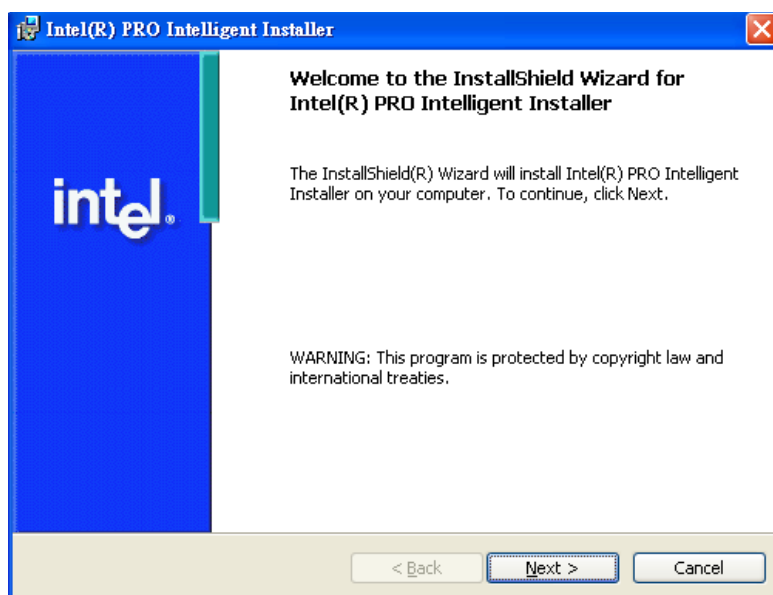
The PCE-5130 Intel 82573/82574 Gigabit integrated controller(s) supports all major network operating systems. However, the installation procedure varies with different operating systems. In the following sections, refer to the one that provides the driver setup procedure for the operating system you are using.

Note! *Correct sequence of onboard Lan controllers (Lan1 & Lan2) shows in the "Onboard Device" BIOS view.*

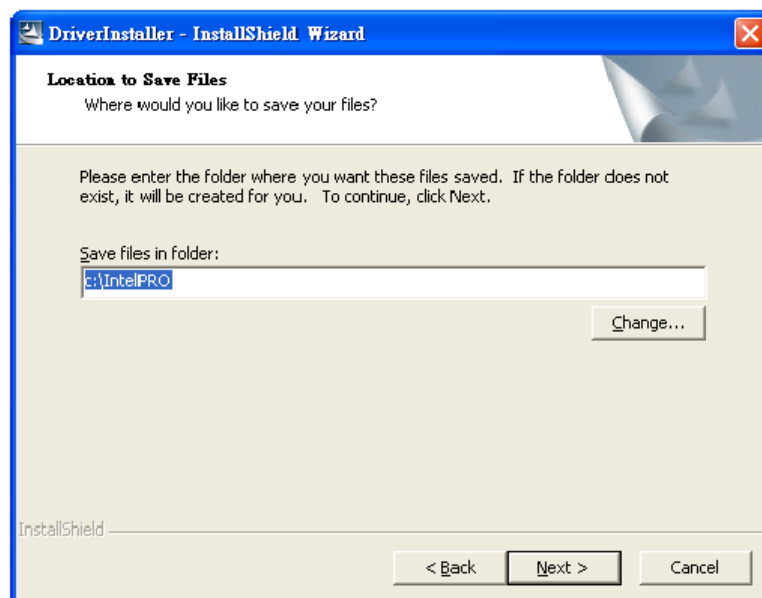


6.4 Win XP Driver Setup

1. Insert the driver CD into your system's CD-ROM drive. Selecting the folder "LAN" then click the proper LAN driver for the OS. Windows XP is used as an example in the following steps.
2. Select "I accept the terms in the license agreement" and click "Next" to continue.



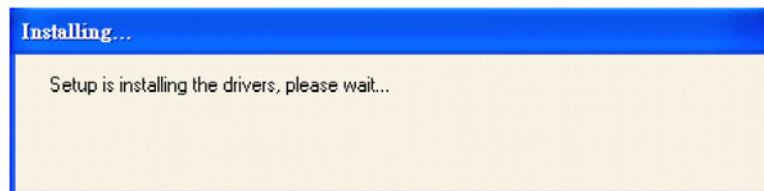
3. Click "Next" to continue.



4. Click "Install Software" to start the installation procedure.



5. The driver will be installed automatically and the LAN function will be enabled after the installation.



Appendix **A**

Programming the Watchdog Timer

A.1 Introduction

The PCE-5130's watchdog timer can be used to monitor system software operation and take corrective action if the software fails to function within the programmed period. This section describes the operation of the watchdog timer and how to program it.

A.1.1 Watchdog timer overview

The watchdog timer is built in to the W83627HF super I/O controller. It provides the following user programmable functions:

- Can be enabled and disabled by user's program
- Timer can be set from 1 to 255 seconds or 1 to 255 minutes
- Generates an interrupt or reset signal if the software fails to reset the timer before time-out

A.1.2 Programming the watchdog timer

The I/O port address of the watchdog timer is 2E (hex) and 2F (hex). 2E (hex) is the address port. 2F (hex) is the data port. You must first write an address value into address port 2E (hex), then write/read data to/from the assigned register through data port 2F (hex).

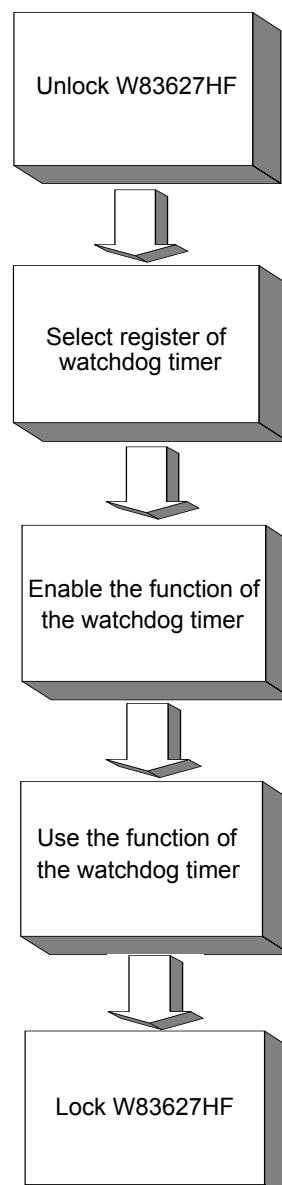


Table A.1: Watchdog timer registers

Address of register (2E)	Attribute Read/Write	Value (2F)& description
87 (hex)	-----	Write this address to I/O address port 2E (hex) twice to unlock the W83627HF
07 (hex)	write	Write 08 (hex) to select register of watchdog timer.
30 (hex)	write	Write 01 (hex) to enable the function of the watchdog timer. Disabled is set as default.
F5 (hex)	write	Set seconds or minutes as units for the timer. Write 0 to bit 3: set second as counting unit. [default]. Write 1 to bit 3: set minutes as counting unit
F6 (hex)	write	0: stop timer [default] 01~FF (hex): The amount of the count, in seconds or minutes, depends on the value set in register F5 (hex). This number decides how long the watchdog timer waits for strobe before generating an interrupt or reset signal. Writing a new value to this register can reset the timer to count with the new value.
F7 (hex)	read/write	Bit 6: Write 1 to enable keyboard to reset the timer, 0 to disable.[default] Bit 5: Write 1 to generate a timeout signal immediately and automatically return to 0. [default=0] Bit 4: Read status of watchdog timer, 1 means timer is "timeout".
AA (hex)	-----	Write this address to I/O port 2E (hex) to lock the watchdog timer 2.

A.1.3 Example program

1. Enable watchdog timer and set 10 sec. as timeout interval

```
-----  
Mov dx,2eh          ; Unlock W83627HF  
Mov al,87h  
Out dx,al  
Out dx,al  
-----  
Mov al,07h          ; Select registers of watchdog timer  
Out    dx,al  
Inc    dx  
Mov    al,08h  
Out    dx,al  
-----  
Dec dx              ; Enable the function of watchdog timer  
Mov    al,30h  
Out    dx,al  
Inc    dx  
Mov    al,01h  
Out    dx,al  
-----  
Dec dx              ; Set second as counting unit  
Mov    al,0f5h  
Out    dx,al  
Inc    dx  
In     al,dx  
And al,not 08h  
Out    dx,al  
-----  
Dec dx              ; Set timeout interval as 10 seconds and start counting  
Mov    al,0f6h  
Out    dx,al  
Inc    dx  
Mov    al,10  
Out    dx,al  
-----  
Dec dx              ; Lock W83627HF  
Mov    al,0aah  
Out    dx,al  
2. Enable watchdog timer and set 5 minutes as timeout interval  
-----  
Mov dx,2eh          ; Unlock W83627HF  
Mov al,87h  
Out dx,al  
Out dx,al
```

```

;-----
Mov al,07h          ; Select registers of watchdog timer
Out  dx,al
Inc  dx
Mov  al,08h
Out  dx,al
;-----
Dec dx              ; Enable the function of watchdog timer
Mov  al,30h
Out  dx,al
Inc  dx
Mov  al,01h
Out  dx,al
;-----
Dec dx              ; Set minute as counting unit
Mov  al,0f5h
Out  dx,al
Inc  dx
In   al,dx
Or  al,08h
Out  dx,al
;-----
Dec dx              ; Set timeout interval as 5 minutes and start counting
Mov  al,0f6h
Out  dx,al
Inc  dx
Mov  al,5
Out  dx,al
;-----
Dec dx              ; Lock W83627HF
Mov  al,0aah
Out  dx,al
3.  Enable watchdog timer to be reset by mouse
;-----
Mov dx,2eh          ; Unlock W83627HF
Mov al,87h
Out dx,al
Out dx,al
;-----
Mov al,07h          ; Select registers of watchdog timer
Out  dx,al
Inc  dx
Mov  al,08h
Out  dx,al
;-----

```

```

Dec dx          ; Enable the function of watchdog timer
Mov    al,30h
Out    dx,al
Inc    dx
Mov    al,01h
Out    dx,al
;-----
Dec dx          ; Enable watchdog timer to be reset by mouse
Mov    al,0f7h
Out    dx,al
Inc    dx
In     al,dx
Or    al,80h
Out    dx,al
;-----
Dec dx          ; Lock W83627HF
Mov    al,0aah
Out    dx,al
4.  Enable watchdog timer to be reset by keyboard
;-----
Mov dx,2eh      ; Unlock W83627HF
Mov al,87h
Out dx,al
Out dx,al
;-----
Mov al,07h      ; Select registers of watchdog timer
Out    dx,al
Inc    dx
Mov    al,08h
Out    dx,al
;-----
Dec dx          ; Enable the function of watchdog timer
Mov    al,30h
Out    dx,al
Inc    dx
Mov    al,01h
Out    dx,al
;-----
Dec dx          ; Enable watchdog timer to be strobed reset by keyboard
Mov    al,0f7h
Out    dx,al
Inc    dx
In     al,dx
Or    al,40h
Out    dx,al

```

```

;-----
Dec dx          ; Lock W83627HF
Mov  al,0aah
Out  dx,al
5.  Generate a time-out signal without timer counting
;-----
Mov dx,2eh      ; Unlock W83627HF
Mov al,87h
Out dx,al
Out dx,al
;-----
Mov al,07h      ; Select registers of watchdog timer
Out  dx,al
Inc  dx
Mov  al,08h
Out  dx,al
;-----
Dec dx          ; Enable the function of watchdog timer
Mov  al,30h
Out  dx,al
Inc  dx
Mov  al,01h
Out  dx,al
;-----
Dec dx          ; Generate a time-out signal
Mov  al,0f7h
Out  dx,al      ;Write 1 to bit 5 of F7 register
Inc  dx
In   al,dx
Or  al,20h
Out  dx,al
;-----
Dec dx          ; Lock W83627HF
Mov  al,0aah
Out  dx,al

```


Appendix **B**

I/O Pin Assignments

B.1 Floppy Drive Connector (FDD1)

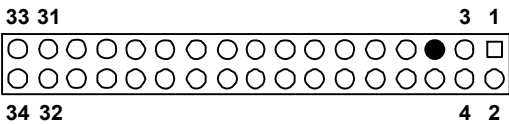


Table B.1: Floppy drive connector (FDD1)			
Pin	Signal	Pin	Signal
1	GND	2	FDHDIN*
3	GND	4	N/C
5	N/C	6	FDEDIN*
7	GND	8	INDEX*
9	GND	10	MOTOR 0*
11	GND	12	DRIVE SELECT 1*
13	GND	14	DRIVE SELECT 0*
15	GND	16	MOTOR 1*
17	GND	18	DIRECTION*
19	GND	20	STEP*
21	GND	22	WRITE DATA*
23	GND	24	WRITE GATE*
25	GND	26	TRACK 0*
27	GND	28	WRITE PROTECT*
29	GND	30	READ DATA*
31	GND	32	HEAD SELECT*
33	GND	34	DISK CHANGE*
* low active			

B.2 Parallel Port Connector (LPT1)

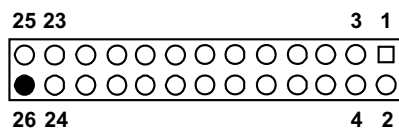


Table B.2: Parallel port connector (LPT1)

Pin	Signal	Pin	Signal
1	STROBE*	2	AUTOFD*
3	D0	4	ERR
5	D1	6	INIT*
7	D2	8	SLCTINI*
9	D3	10	GND
11	D4	12	GND
13	D5	14	GND
15	D6	16	GND
17	D7	18	GND
19	ACK*	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	N/C

* low active

B.3 VGA Connector (VGA1)

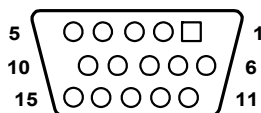


Table B.3: VGA connector (VGA1)

Pin	Signal	Pin	Signal
1	RED	9	VCC
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	SDT
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	SCK
8	GND		

B.4 RS-232 Serial Port (COM1)

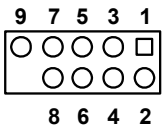


Table B.4: RS-232 serial port (COM1)

Pin	Signal
1	DCD
2	DSR
3	RXD
4	RTS
5	TXD
6	CTS
7	DTR
8	RI
9	GND
10	N/A

B.5 RS 232/422/485 Serial Port (COM2)

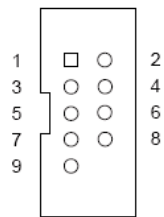


Table B.5: RS-232 / 422 / 485 serial port (COM2)

Pin	Signal
1	DCD
2	DSR
3	SIN
4	RTS
5	SOUT
6	CTS
7	DTR
8	RI
9	GND

B.6 USB Header (USB12 ~ 34)

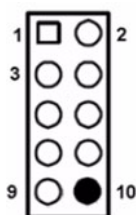


Table B.6: USB Header (USB12 ~ 34)

Pin	Signal	Pin	Signal
1	USB1_VCC5	6	USB2_D+
2	USB2_VCC5	7	GND
3	USB1_D-	8	GND
4	USB2_D-	9	GND
5	USB1_D+	10	Key

B.7 PS/2 Keyboard/Mouse Connector (KBMS1)

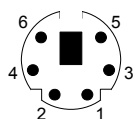


Table B.7: PS/2 keyboard/mouse connector (KBMS1)

Pin	Signal
1	KB DATA
2	MS DATA
3	GND
4	VCC
5	KB CLOCK
6	MS CLOCK

B.8 External Keyboard Connector (KBMS2)

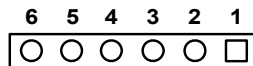


Table B.8: External keyboard connector (KBMS2)

Pin	Signal
1	KBCLK
2	KBDAT
3	MSDAT
4	GND
5	MSVCC
6	MSCLK

B.9 CPU Fan Power Connector (CPUFAN1)

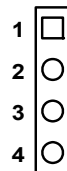


Table B.9: CPU fan power connector (CPUFAN1)

Pin	Signal
1	GND
2	+12V
3	Detect
4	FANPWM

B.10 Power LED and Keyboard Lock Connector (JFP3 / PWR_LED & KEY LOCK)

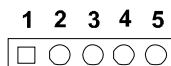


Table B.10: Power LED and keyboard lock connector (JFP3 / PWR_LED & KEY LOCK)

Pin	Signal
1	LED power (+5 V)
2	NC
3	GND
4	KEYLOCK#
5	GND

B.11 External Speaker Connector (JFP2 / SPEAKER)

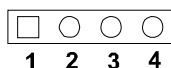


Table B.11: External speaker connector (JFP2 / SPEAKER)

Pin	Signal
1	SPK+
2	NC
3	SPK_IN
4	SPK-

B.12 Reset Connector (JFP1 / RESET)

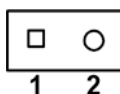


Table B.12: Reset connector (JFP1 / RESET)

Pin	Signal
1	RESET #
2	GND

B.13 HDD LED (JFP2 / HDDLED)

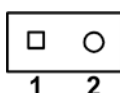


Table B.13: HDD LED (JFP2 / HDDLED)

Pin	Signal
1	IDE LED+
2	IDE LED-

B.14 ATX Soft Power Switch (JFP1 / PWR_SW)

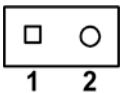


Table B.14: ATX soft power switch (JFP1 / PWR_SW)

Pin	Signal
1	5 VSB
2	PWR-BTN

B.15 Hi-definition Audio Link Connector (HDAUD1)

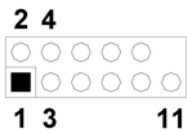


Table B.15: Hi-definition audio link connector (HDAUD1)

Pin	Signal	Pin	Signal
1	ACZ_VCC	2	GND
3	ACZ_SYNC	4	ACZ_BITCLK
5	ACZ_SDOUT	6	ACZ_SDIN0
7	ACZ_SDIN1	8	-ACZ_RST
9	ACZ_12V	10	GND
11	GND	12	N/C

B.16 SM Bus Connector (JFP2 / SNMP)

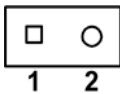


Table B.16: SM bus connector (JFP2 / SNMP)

Pin	Signal
1	SMB_DATA
2	SMB_CLK

B.17 LAN1 and LAN2 LED Connector (LANLED1)

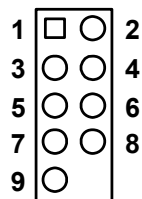


Table B.17: LAN1 and LAN2 LED connector (LANLED1)

Pin	Signal
1	#LAN1_ACT
2	#LAN2_ACT
3	V33_AUX
4	V33_AUX
5	#LAN1_LINK1000
6	#LAN2_LINK1000
7	#LAN1_LINK100
8	#LAN2_LINK100
9	V33_AUX

B.18 GPIO Header (GPIO1)

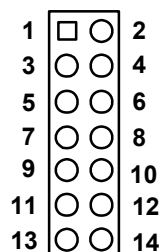


Table B.18: GPIO header (GPIO1)

Pin	Signal
1	GPIO_1
2	GPIO_5
3	VCC_GPIO
4	GND
5	GPIO_2
6	GPIO_6
7	GND
8	GND
9	GPIO_3
10	GPIO_7
11	GND
12	GND
13	GPIO_4
14	GPIO_8

B.19 System I/O Ports

Table B.19: System I/O ports

Addr. range (Hex)	Device
000-01F	DMA controller
020-021	Interrupt controller 1, master
022-023	Chipset address
040-05F	8254 timer
060-06F	8042 (keyboard controller)
070-07F	Real-time clock, non-maskable interrupt (NMI) mask
080-09F	DMA page register
0A0-0BF	Interrupt controller 2
0C0-0DF	DMA controller
0F0	Clear math co-processor
0F1	Reset math co-processor
0F8-0FF	Math co-processor
200-207	Game I/O
290-297	On-board hardware monitor
2F8-2FF	Serial port 2
378-37F	Parallel printer port 1 (LPT2)
3B0-3BF	Intel(R) Q35 Express Chipset Family
3C0-3CF	Intel(R) Q35 Express Chipset Family
3D0-3DF	Color/graphics monitor adapter
3F0-3F7	Diskette controller
3F8-3FF	Serial port 1
2F8-2FF	Serial port 2
400-41F	SM bus controller
480-4BF	CPU card resource
400-4D1	CPU card resource
4E0-4E7	Serial port 6
4E8-4EF	Serial port 4
4F0-4F7	Serial port 5
4F8-4FF	Serial port 3
800-87F	Power management

B.20 DMA Channel Assignments

Table B.20: DMA channel assignments

Channel	Signal
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

B.21 Interrupt Assignments

Table B.21: Interrupt assignments

Priority	Interrupt#	Interrupt source
1	NMI	Parity error detected
2	IRQ0	Interval timer
3	IRQ1	Keyboard
-	IRQ2	Interrupt from controller 2 (cascade)
4	IRQ8	Real-time clock
5	IRQ9	Cascaded to INT 0A (IRQ 2)
6	IRQ10	Serial Port 4, 6
7	IRQ11	Serial Port 3, 5
8	IRQ12	PS/2 mouse
9	IRQ13	INT from co-processor
10	IRQ14	Primary IDE Channel
11	IRQ15	Secondary IDE Channel
12	IRQ3	Serial communication port 2
13	IRQ4	Serial communication port 1
14	IRQ5	NA
15	IRQ6	NA
16	IRQ7	Parallel port 1 (print port)

B.22 1st MB Memory Map

Table B.22: 1st MB memory map

Addr. range (Hex)	Device
E0000h - FFFFFh	BIOS
CC000h - DFFFFh	Unused
C0000h - CBFFFh	VGA BIOS
A0000h - BFFFFh	Video Memory
00000h - 9FFFFh	Base memory

B.23 PCI Bus Map

Table B.23: PCI bus map

Signal	IDSEL	INT# pin	GNT	REQ
PCI slot 1	AD31	INT B,C,D,A	GNT A	REQ A
PCI slot 2	AD30	INT C, D, A, B	GNT B	REQ B
PCI slot 3	AD29	INT D,A,B,C	GNT C	REQ C
PCI slot 4	AD28	INT A, B, C, D	GNT D	REQ D

Appendix **C**

Programming the GPIO

C.1 Supported GPIO Register

Below are the detailed descriptions of the GPIO addresses and programming sample.

C.1.1 GPIO registers

CRF0 (GP10-GP17 I/O selection register. Default 0xFF)

When set to a '1', respective GPIO port is programmed as an input port.

When set to a '0', respective GPIO port is programmed as an output port.

CRF1 (GP10-GP17 data register. Default 0x00)

If a port is programmed to be an output port, then its respective bit can be read/written.

If a port is programmed to be an input port, then its respective bit can only be read.

CRF2 (GP10-GP17 inversion register. Default 0x00)

When set to a '1', the incoming/outgoing port value is inverted.

When set to a '0', the incoming/outgoing port value is the same as in data register.

Extended Function Index Registers (EFIRs)

The EFIRs are write-only registers with port address 2Eh or 4Eh on PC/AT systems.

Extended Function Data Registers (EFDRs)

The EFDRs are read/write registers with port address 2Fh or 4Fh on PC/AT systems.

C.1.2 GPIO example program-1

Enter the extended function mode, interruptible double-write

```
MOV DX,4EH  
MOV AL,87H  
OUT DX,AL  
OUT DX,AL
```

Configure logical device 7(GP10~GP17), configuration register CRF0,CRF1,CRF2

```
MOV DX,4EH  
MOV AL,07H ; Point to Logical Device Number Reg.  
OUT DX,AL  
MOV DX,4FH  
MOV AL,07H ; Select logical device 7  
OUT DX,AL ;  
MOV DX,4EH  
MOV AL,F0  
OUT DX,AL  
MOV DX,4FH
```

```
MOV AL,00H ; 01:Input 00:output for GP10~GP17
OUT DX,AL
MOV DX,4EH
MOV AL,F2H ;
OUT DX,AL
MOV DX,4FH
MOV AL,00H ;Set GPIO is normal not inverter
OUT DX,AL;
MOV DX,4EH
MOV AL,F1H
OUT DX,AL
MOV DX,4FH
MOV AL,??H ; Put the output value into AL
OUT DX,AL
```

Exit extended function mode

```
MOV DX,4EH
MOV AL,AAH
OUT DX,AL
```

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