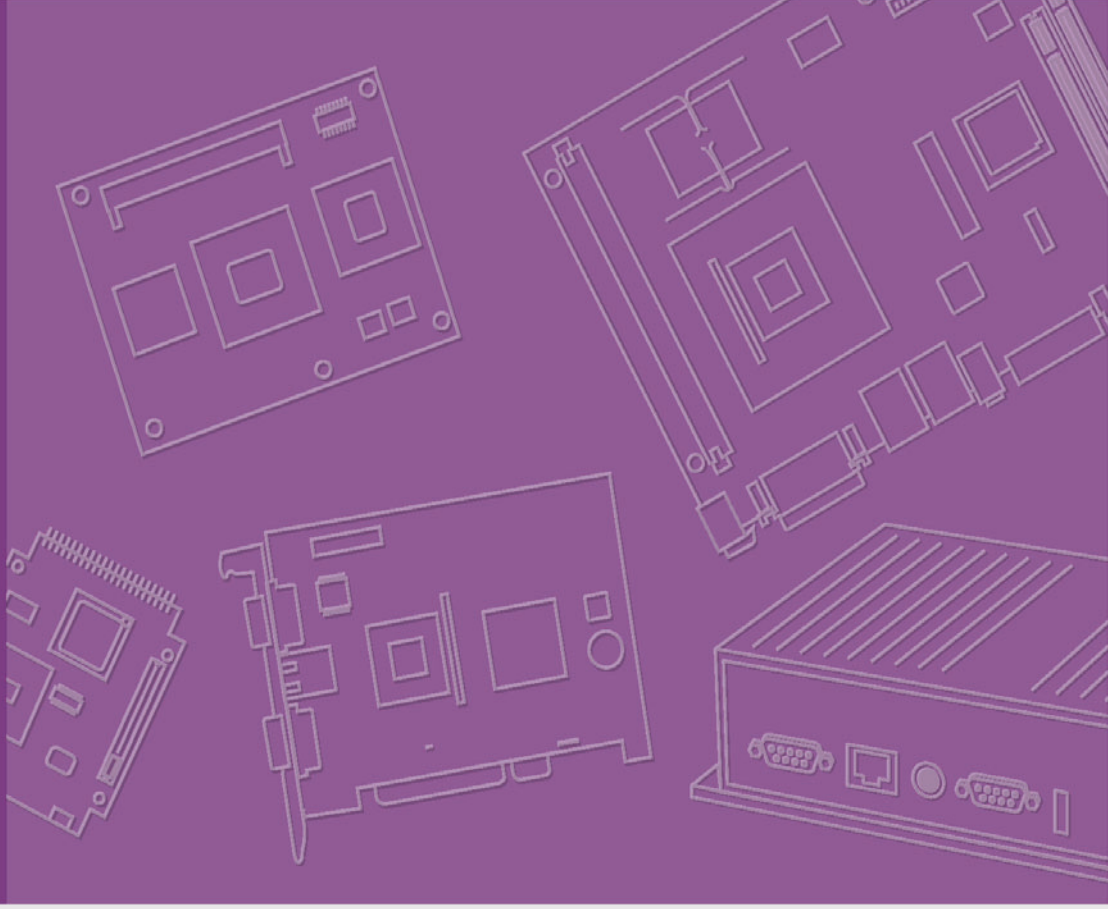

User Manual

PCA-6743

DM&P Vortex86DX-800MHz SOC, ISA Half-size SBC, TTL, 10/100 Ethernet, CFC, On board memory

Trusted ePlatform Services

ADVANTECH

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Part No. 2002674300 Edition 1

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Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
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 merchandise 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.

Declaration of Conformity

FCC Class A

Note: 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 equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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.*

Technical Support and Assistance

1. Visit the Advantech web site at www.advantech.com/support where you can find the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
   - Product name and serial number
   - Description of your peripheral attachments
   - Description of your software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wording of any error messages

Packing List

Before setting up the system, check that the items listed below are included and in good condition.

- 1 PCA-6743 Series Half-size CPU Card
- 1 Startup manual (P/N: 2002674310)
- 1 Utility CD (P/N: 2062674300)
- 1 mini jumper pack
- Cables

Part Number	Description
1700060202	Y cable for PS/2 Keyboard, PS/2 Mouse
1701400607	E-IDE (HDD) cable (2.54 mm 40P 600 mm)
1700014398	4-port USB cable kit (2.0 mm pitch)
1701340705	FDD cable (2.54 mm 700 mm) (For F SKU)
1701260305	COM2 (2.54 mm) + LPT (2.54 mm) cable (For F SKU)
1700008762	Dual-COM port cable kit for COM 3-4 (2.00 mm) (For F SKU)
1700003194	SATA HDD data cable (For F SKU)
1703150102	SATA HDD power cable (For F SKU)

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

Ordering Information

P/N	VGA	TTL	USB	SATA	COM	PC104	LPT	CFC	FDD	OnBoard RAM
PCA-6743VE-Q0A1E	1	1	4	N/A	2 RS-232	N/A	1	1	1	256 MB
PCA-6743F-Q0A1E	1	1	4	1	2 RS-232 2 RS-232/422/485	1	1	1	1	512 MB

Contents

Chapter 1

General Information

This chapter gives background information on the PCA-6743 ISA Half-size CPU Card.

1.1 Introduction

The PCA-6743 is the ultimate cost-effective solution for limited space applications. It offers all the functions of an AT-compatible industrial computer on a single board. The new CPU module supports DM&P Vortex86DX SOC (system on chip) which supports ISA interfaces. The Vortex86DX is a high performance and fully static 32-bit X86 processor compatible with Windows based, Linux, and most popular 32-bit RTOS. It also integrates floating-point Unit, 32KB write through 4-way L1 cache, 4-way 256KB L2 cache, PCI rev. 2.1 32-bit bus interface at 33 MHz, DDR2, ROM controller, IPC (Internal Peripheral Controllers with DMA and interrupt timer/counter included), Fast Ethernet, FIFO UART, USB2.0 Host and IDE controller within a single 581-pin BGA package to form a system-on-a-chip (SOC).

PCA-6743 is ideal for data-acquisition, environment monitoring system, Intelligent Vehicle management device, factory automation, and medical applications that requires basic X86 computing power for various low-power.

On-board features include a 10/100 Ethernet interface, Compact Flash socket (Type I/II) shared with secondary IDE, Enhanced IDE interface, one parallel port, four serial ports (1*RS232 on rear I/O, 2*RS232, 1*RS232/422/485), and a PS/2 keyboard/mouse interface. An SVGA/LCD display controller (LCD and CRT displays) allows LCD screen resolutions up to 1024 x 768 @ 18/24 bit LVDS/TTL (Optional) and CRT resolutions up to 1024 x 768 @ 24 bit true color. The PCA-6743 complies with the "Green Function" standard and supports three types of power saving features: Normal, Doze and Sleep modes. If you need any additional functions, the PCA-6743 has a PC/104 connector for future upgrades.

1.2 Features

- **Ultra low power, fan-less DM&P Vortex86DX- 800 MHz**
- **Integrate Floating-point Unit**
- **Supports 512MB(F SKU) /256MB(VE SKU) on-board DDR2 SDRAM memory**
- **Supports CRT+LCD dual independent display**
- **Supports 24-bit LVDS/TTL**
- **Support 10/100 Ethernet**
- **Supports Embedded Software API, Watchdog, GPIO, brightness control and backlight on/off**
- **Supports Embedded Software Utility, BIOS flash, eSOS, Embedded Security ID, and Flash Lock**

1.3 Product Specifications

1.3.1 Standard ISA Half-sized SBC Functions

- **CPU: Processor: DM&P Vortex86DX SOC 800 MHz**
  - x86 Compatible Processor Core
    6 stage pipeline
  - Floating point unit support
  - Embedded I / D Separated L1 Cache
    16K I-Cache, 16K D-Cache
  - DMA Controller
  - Operating Voltage Range
    Core voltage: 0.9 V ~ 1.1V
    I / O voltage: 1.8 V 5%, 3.3 V 10%
  - Package Type
    27x27, 581 Ball BGA
- **BIOS: Award integrated 16 Mbit ROM in SOC**
- **Chipset: DM&P Vortex86DX**
- **System memory: On board DDR2 333 SDRAM Memory 512 MB (F SKU) / 256 MB (VE SKU)**
- **Enhanced IDE interface: 1 EIDE channel for two devices. Supports UDMA 100 mode**
- **CFC: Solid State Disk (SSD) supports one 50-pin socket for CFC type I (type II optional) shared with primary IDE**
- **Watchdog timer: 255 level timer interval, setup by software or Jumper less selection generates system reset or IRQ**
- **USB interface: Support 4 ports USB 2.0**
- **Expansion Interface: Supports ISA interface**

1.3.2 VGA/flat panel Interface

- **Chipset: VGA mode: SM712 graphic chip**
- **LCD mode: SMI SM712 2D graphic chip**
- **Memory Size: 4 MB display memory**
- **Display mode: VGA mode supports 1024 x 768 @ 24bit true color**
  LCD mode supports 1024 x 768 @ 18/24 bit TTL / LVDS (Optional) TFT panel.
  Dual Display: CRT+TTL, support extended mode and clone mode

1.3.3 Ethernet Interface

- **Supports Dual 10/100 Mbps Ethernet networking**
- **LAN Controller: Integrated Vortex86DX SOC 10/100 Mbps Ethernet**

1.4 Mechanical and environmental

Dimensions: 185 mm (L) x 122 mm (W) (7.3" x 4.8")

Power supply voltage: Typical: +5V @ 1.6 A

Power requirement: Max: +5V @ 2 A

Operating temperature: 0 ~ 60°C (32 ~ 140° F)
Operating humidity: 0% ~ 90% relative humidity, non-condensing
Weight: 0.27 Kg (0.59 lb)

Chapter 2

H/W Installation

This chapter explains the setup procedures of the PCA-6743 hardware, including instructions on setting jumpers and connecting peripherals, switches, indicators and mechanical drawings. Be sure to read all safety precautions before you begin the installation procedure.

2.1 Jumper and Connector locations

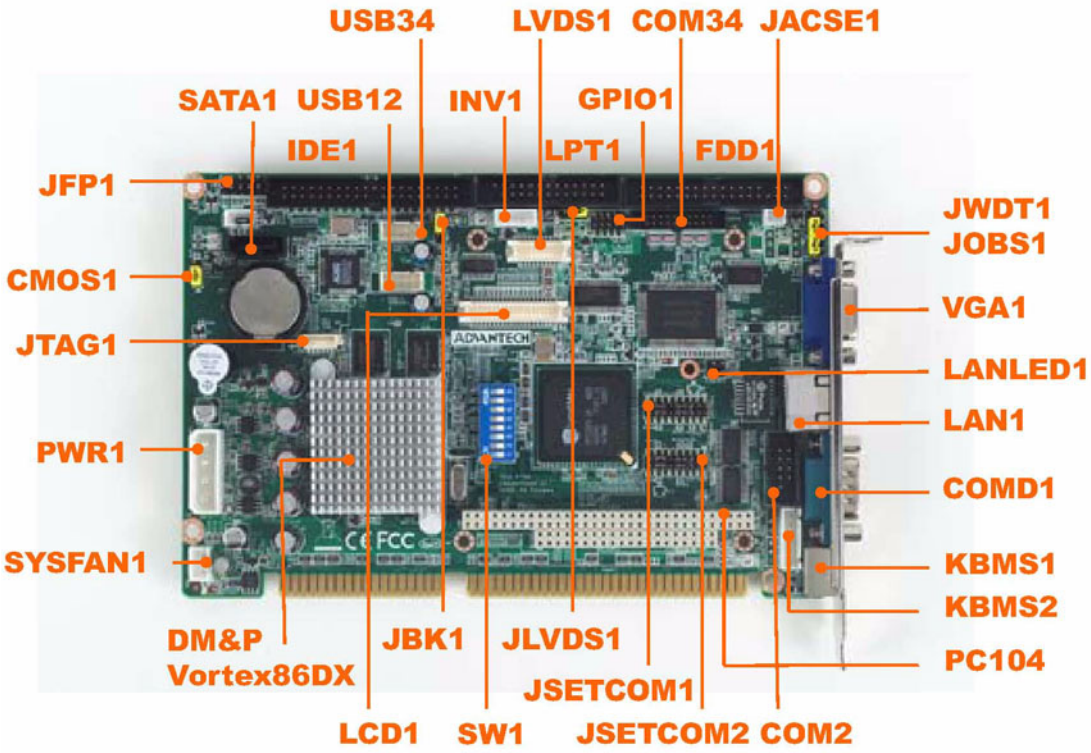


Figure 2.1 Jumper and Connector Locations (component side)

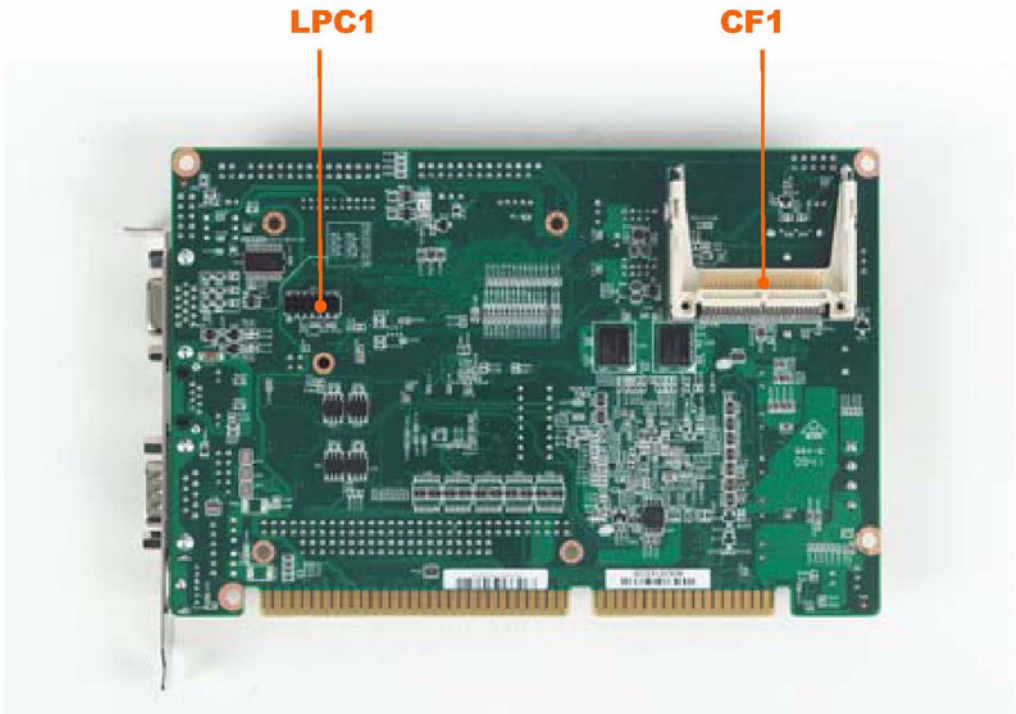


Figure 2.2 Jumper and Connector Locations (solder side)

2.2 Jumpers and Connectors

Connectors on the board link it to external devices such as hard drives, a keyboard or expansion bus connectors. The board also has a number of jumpers that allow you to configure your system to suit your application.

The table below lists the function of each jumper:

Table 2.1: Jumpers

Label	Function
CMOS1	CMOS Clear
JSETCOM1	COM1 function selection
JSETCOM2	COM2 function selection
JWDT1	Watchdog timer output selection
JOBS1	HW Monitor Alarm
JLVDS1	LVDS voltage selection
JBK1	Backlight control selection

The following table lists the connectors on the PCA-6743.

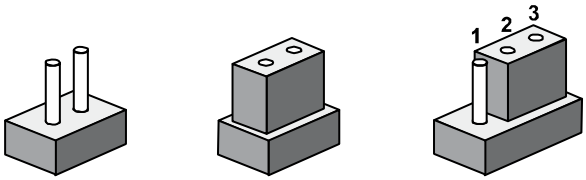
Table 2.2: Connectors

Label	Function
JFP1(1-2)	HDD LED
JFP1(3-4)	Power LED
JFP1(5-6)	N/C
JFP1(7-8)	Reset switch
JFP1(9-10)	N/C
JIR1	IR connector
IDE1	IDE connector (Secondary channel)
CF1	CF connector (Primary channel)
LPT1	Parallel port
USB12	USB port 1,2
USB34	USB port 3,4
COMD1	Serial Port: COM1 (RS232/422/485)
COM2	Serial Port: COM2 (RS232/422/485)
COM34	Serial Port COM3/COM4
KBMS1	PS/2 keyboard and mouse connector
KBMS2	External keyboard and mouse connector
VGA1	VGA connector
LAN1	10/100 Ethernet connector
LANLED1	Front Panel LAN Indicator connector
JCASE1	Case Open
SYSFAN1	FAN connector (3-pin)
PWR1	ATX 12V/5V power connector
GPIO1	GPIO pin header
BT1	RTC battery connector
LCD1	LCD connector
LVDS1	LVDS connector
INV1	Inverter connector
JTAG1	JTAG connector

Table 2.2: Connectors	
LPC1	LPC connector
SATA1	Serial ATA1
PC104	PC104 connector

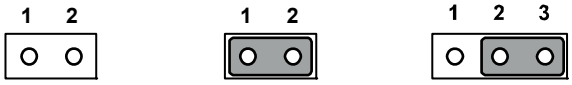
2.3 Setting jumpers

You may configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electrical switch. 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" a jumper, you connect the pins with the clip. To "open" a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case you would connect either pins 1 and 2 or 2 and 3.



open **closed** **closed 2-3**

The jumper settings are schematically depicted in this manual as follows:



open **closed** **closed 2-3**

A pair of needle-nose pliers may be helpful when working with jumpers.

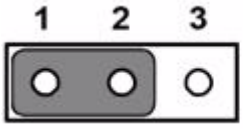
If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

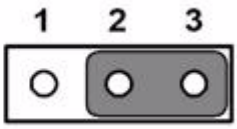
Generally, you simply need a standard cable to make most connections.

2.3.1 Setting details

Table 2.3: CMOS1 CMOSW Clear

Setting	Function
1-2	Clear CMOS
2-3	Normal operation





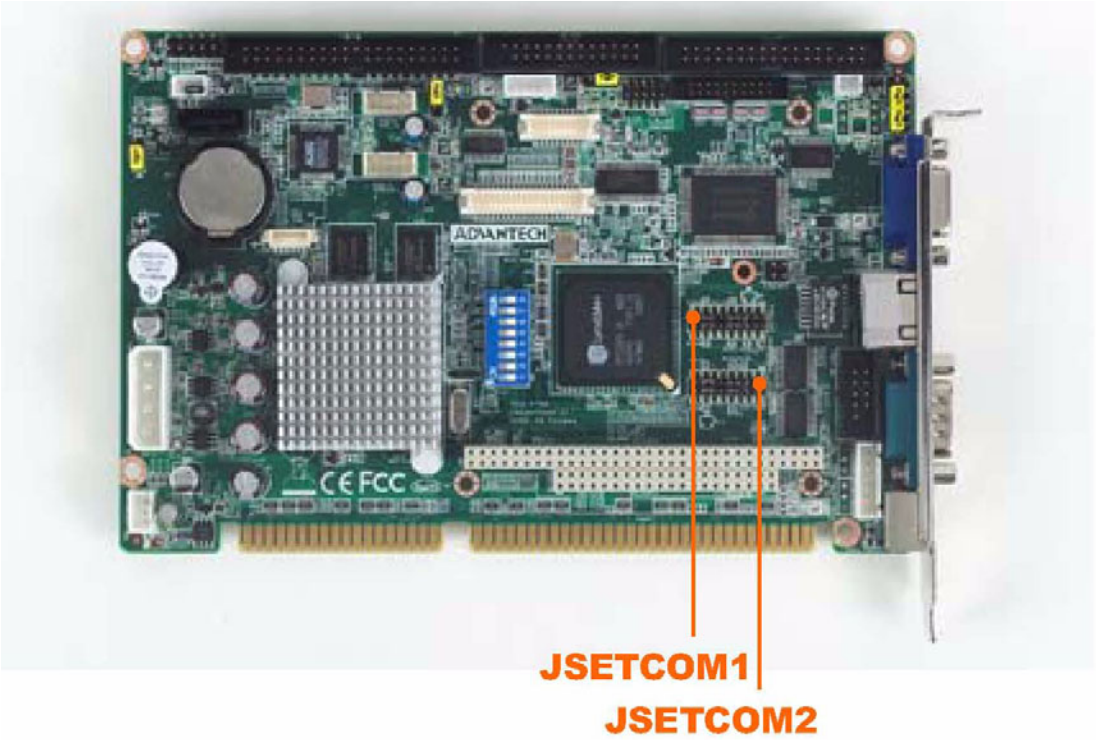


Table 2.4: *JSETCOM1 COM1 function selection*
JSETCOM2 COM2 function selection

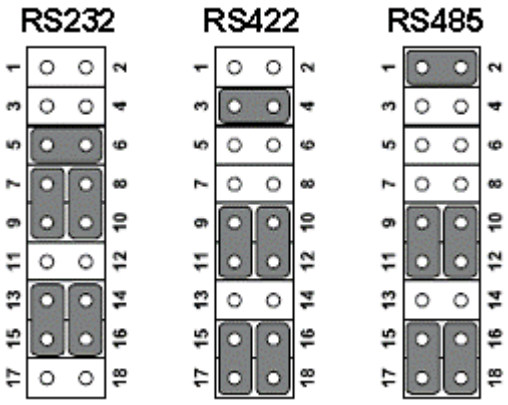
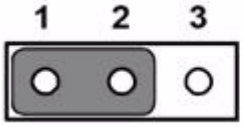


Table 2.5: JWDT1 Watchdog timer output selection

Setting	Function
1-2	IRQ11
2-3	System reset



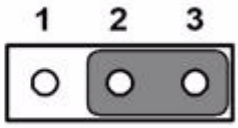
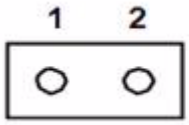
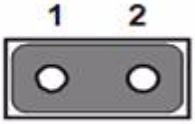


Table 2.6: JOBS1 HW Monitor Alarm

Setting	Function
1-2 Closed	Enable OBS alarm
1-2 Open	Disable OBS alarm





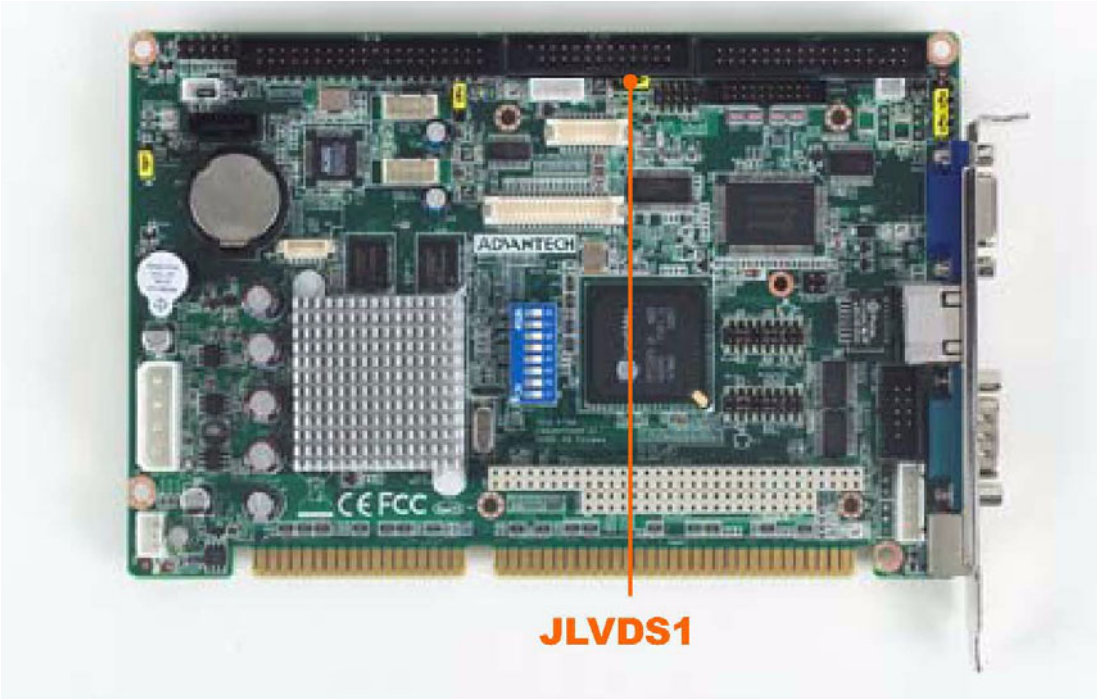
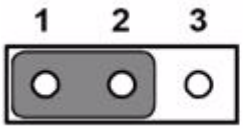
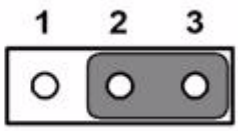


Table 2.7: JLVDS1 LVDS voltage selection	
Setting	**Function**
1-2 Close	+V_LCD voltage = 3.3V
2-3 Close	+V_LCD voltage = 5V

Table 2.8: JBK1 Backlight control selection	
Setting	Function
1-2 Close	Backlight control by linear voltage
2-3 Close	Backlight control by PWM





The following sections tell how to make each connection. In most cases, you will simply need to connect a standard cable. All of the connector pin assignments are shown in Appendix A.

Warning! *Always completely disconnect the power cord from your chassis whenever you are working on it. Do not make connections while the power is on. Sensitive electronic components can be damaged by a sudden rush of power. Only experienced electronics personnel should open the PC chassis.*

Caution! *Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. 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.*

2.4 Front Panel Connectors (JFP1)

There are several external switches to monitor and control the PCA-6743.

2.5 IR Connector (JIR1)

This connector supports the optional wireless infrared transmitting and receiving module. This module mounts on the system case. You must configure the setting through BIOS setup.

2.6 IDE Connector (IDE1)

The board provides 1 IDE channel which you can attach up to two enhanced Integrated Drive Electronics hard disk drives or CDROM to the board's internal controller. This advanced IDE controller supports faster data transfer up to UDMA 100.

2.6.1 Connecting the hard drive

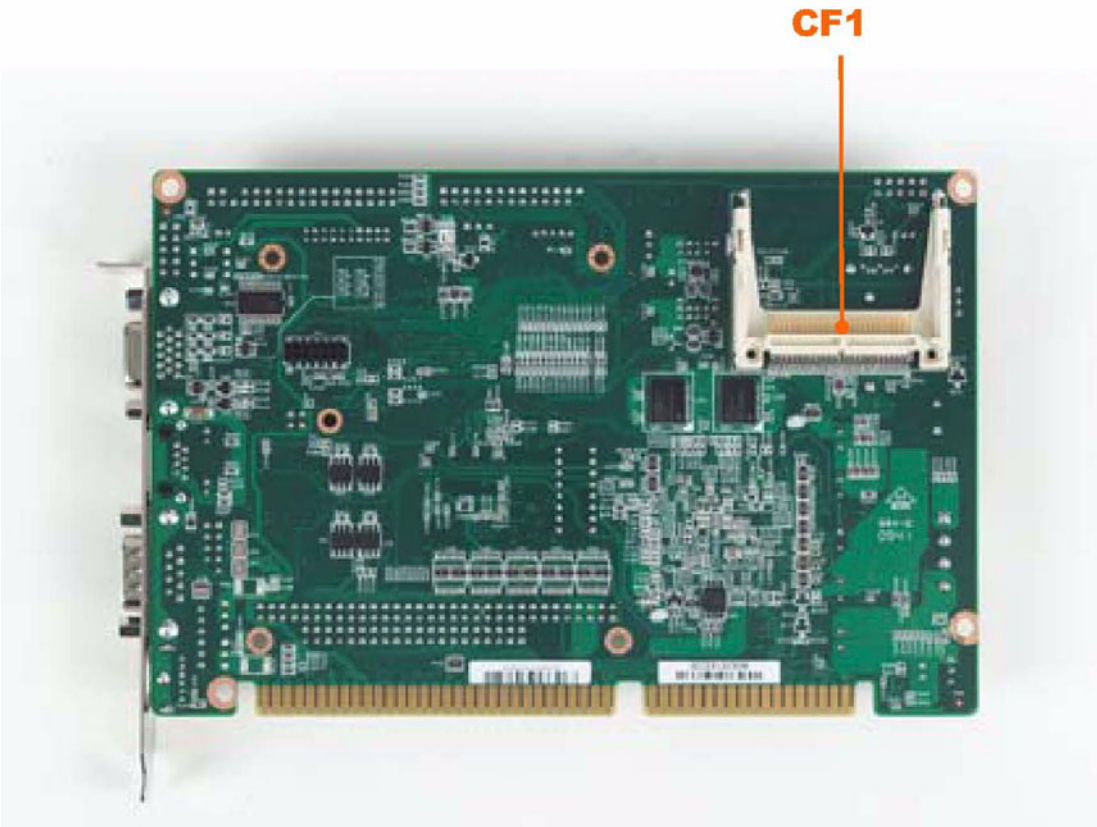
1. Connect one end of the cable to Hard Drive connector. Make sure that the red (or blue) wire corresponds to pin 1 on the connector, which is labeled on the board (on the right side).
2. Plug the other end of the cable into the Enhanced IDE hard drive, with pin 1 on the cable corresponding to pin 1 on the hard drive.

(See your hard drive's documentation for the location of the connector.)

If desired, connect a second drive as described above. Unlike floppy drives, IDE hard drives can connect to either end of the cable. If you install two drives, you will need to set one as the master and one as the slave by using jumpers on the drives. If you install only one drive, set it as the master.

2.7 Compact Flash card Socket (CF1)

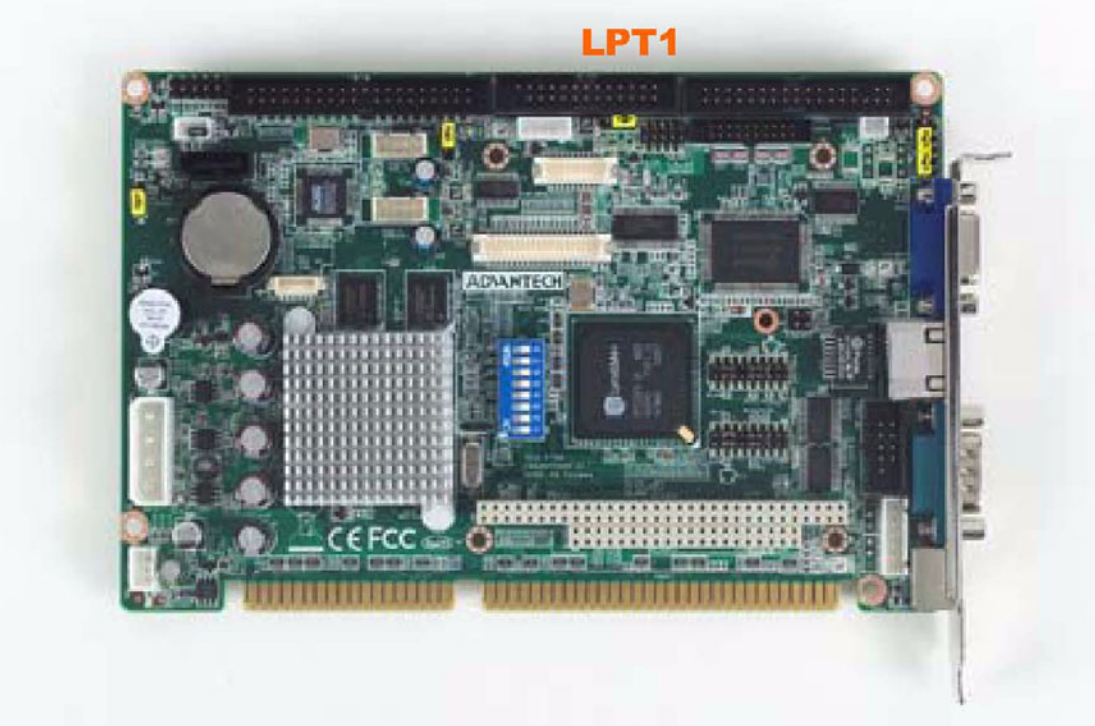
The board provides a CompactFlash card type I/II socket. The CompactFlash card shares a secondary IDE channel.



2.8 Parallel Port Connector (LPT1)

The parallel port is designated as LPT1, and is normally used to connect the CPU card to a printer. The PCA-6743 includes an onboard parallel port, accessed through a 26-pin flat-cable connector. The card comes with an adapter cable which lets you use a traditional DB-25 connector. The cable has a 26-pin connector on one end and a DB-25 connector on the other, mounted on a retaining bracket. The bracket installs at the end of an empty slot in your chassis, giving you access to the connector.

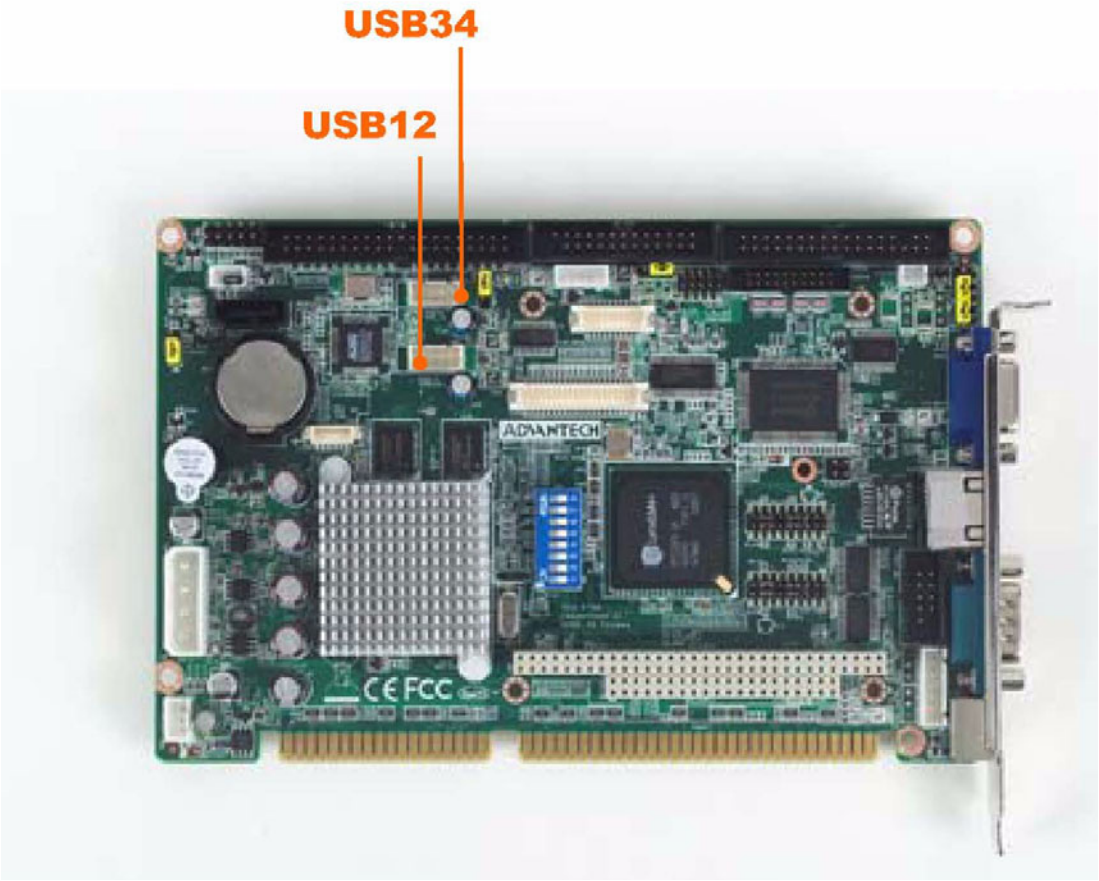
To install the bracket, find an empty slot in your chassis. Unscrew the plate that covers the end of the slot. Screw in the bracket in place of the plate. Next, attach the flat-cable connector to LPT1 on the CPU card. Wire 1 of the cable is red or blue, and the other wires are gray. Make sure that wire 1 corresponds to pin 1 of LPT1. Pin 1 is on the right side of LPT1.



2.9 USB Ports (USB12 & USB34)

The PCA-6743 provides up to four ports of USB (Universal Serial Bus) interface, which gives complete Plug & Play and hot swapping for up to 127 external devices. The USB interface complies with USB Specification Rev. 2.0 support transmission rate up to 480 Mbps and is fuse-protected. The USB interface can be disabled in the system BIOS setup.

The USB interface is accessed through two 5 x 2-pin pin header connectors. You will need an adapter cable if you use a standard USB connector. The adapter cable has a 5 x 2-pin connector on one end and a USB connector on the other. The USB interfaces can be disabled in the system BIOS setup.

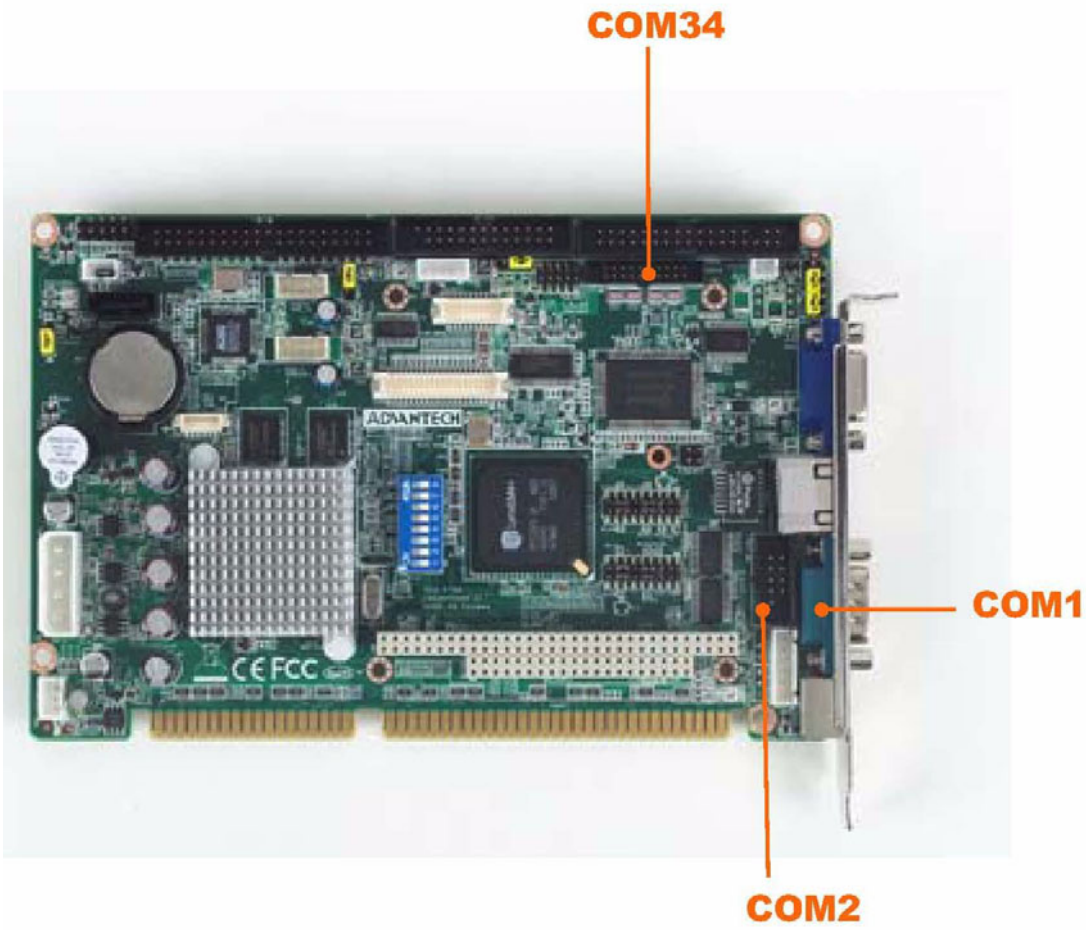


2.10 Serial Ports (COM1 & COM2 & COM34)

The PCA-6743 offers four serial ports, COMD1 as COM1 (RS-232 (VE SKU)/ RS-232/RS-422/RS-485 (F SKU) on real I/O) and COM2 as COM2 (RS-232(VE SKU)/ RS-232/RS-422/RS-485 (F SKU) on one 2.54mm pitch wafer box) and COM34 as COM3, COM4 (2*RS-232 (F SKU) on one 2.0mm pitch wafer box). 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 standard in different ways. If you are having problems with a serial device, be sure to check the pin assignments for the connector.

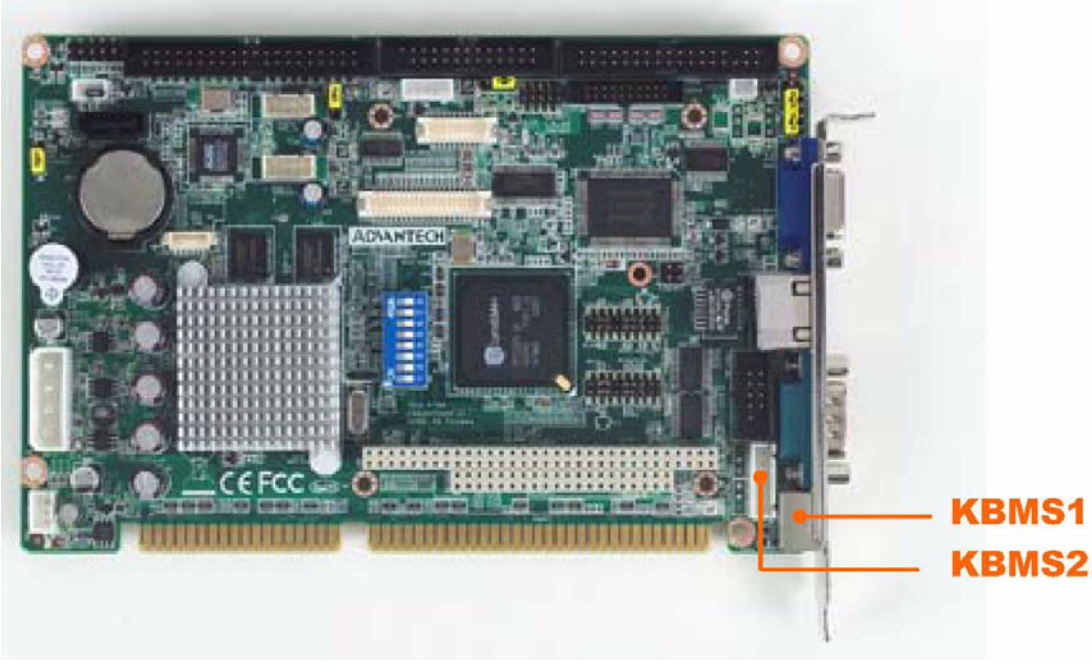


2.10.1 COM1 & COM2 RS-232/RS-422/RS-485 setting

COM1, COM2 can be configured to operate in RS-232, RS-422, or RS-485 mode. Please check the JSETCOM1, JSETCOM2 setting

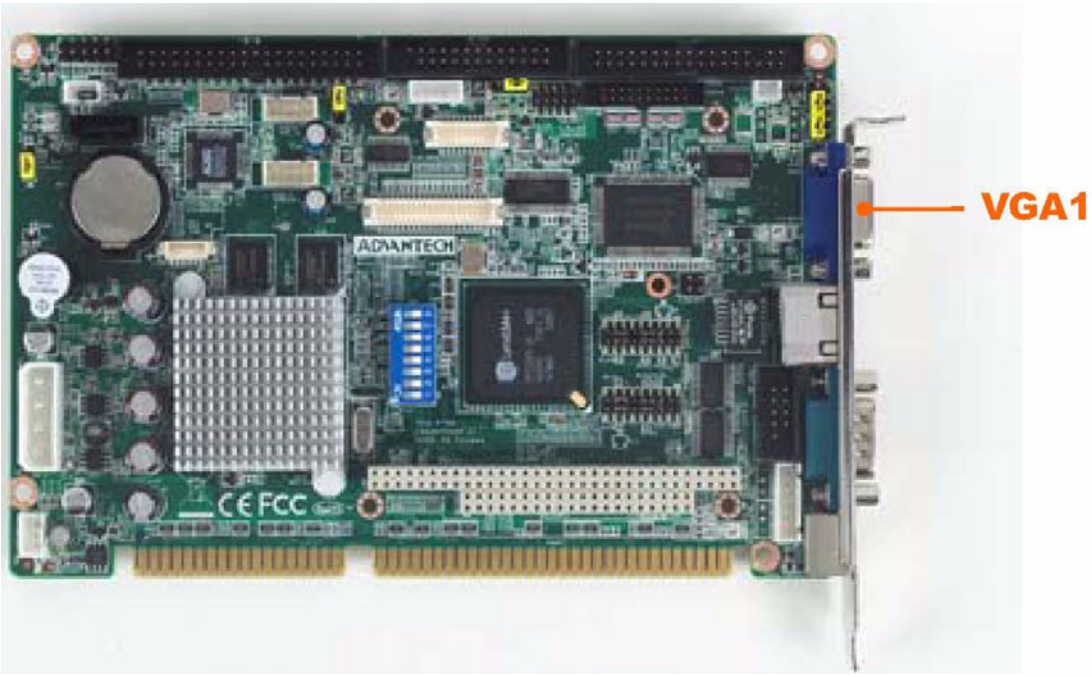
2.11 PS/2 Keyboard / Mouse connector (KBMS1 & 2)

One 6-pin mini-DIN connectors (KBMS1) on the card mounting bracket provide connection to a PS/2 keyboard and a PS/2 mouse, respectively. KBMS2 (5-pin 2.54mm wafer box) can also be connected to an adapter cable (P/N: 1700060202, available from Advantech) for connecting to both a PS/2 keyboard.



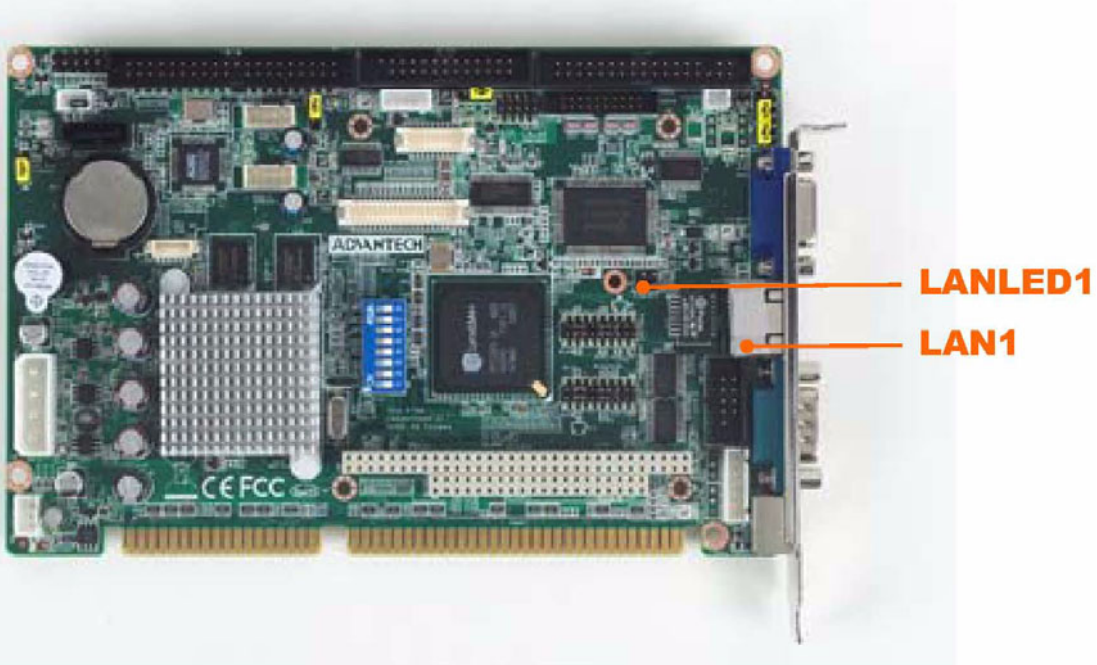
2.12 VGA connector (VGA1)

The PCA-6743 includes a VGA interface that can drive conventional CRT displays. VGA1 is a 12-pin, dual-inline header used for conventional CRT displays. A simple one-to-one adapter can be used to match VGA1 to a standard 15-pin D-SUB connector commonly used for VGA. Users can drive a standard progressive scan analog monitor with pixel resolution up to 1024 x 768 @85Hz. Pin assignments for CRT display connector VGA1 are detailed in Appendix A.



2.13 Ethernet connector (LAN1)

The PCA-6743 is equipped with a high performance 32-bit PCI-bus Fast Ethernet interface which is fully compliant with IEEE 802.3u 10/100Base-T specifications. It is supported by all major network operating systems.



2.13.1 Network boot

The network boot feature is built into the BIOS. It can be enabled or disabled in the chipset setup of the CMOS configuration. Refer to "BIOS Setting" in Chapter 3 for more information.

2.14 Front Panel LAN Indicate connector (LANLED1)

This LED is active for LAN connects; PCA-6743 provides an external LAN LED Pin header for connecting to the front side of the chassis. With this convenient design users may know whether the LAN port is acting or not easily. Refer to Appendix A for detailed information on the pin assignments.

2.15 System FAN connector (SYSFAN1)

If fan is used, this connector supports cooling fans of 500mA (6W) or less.

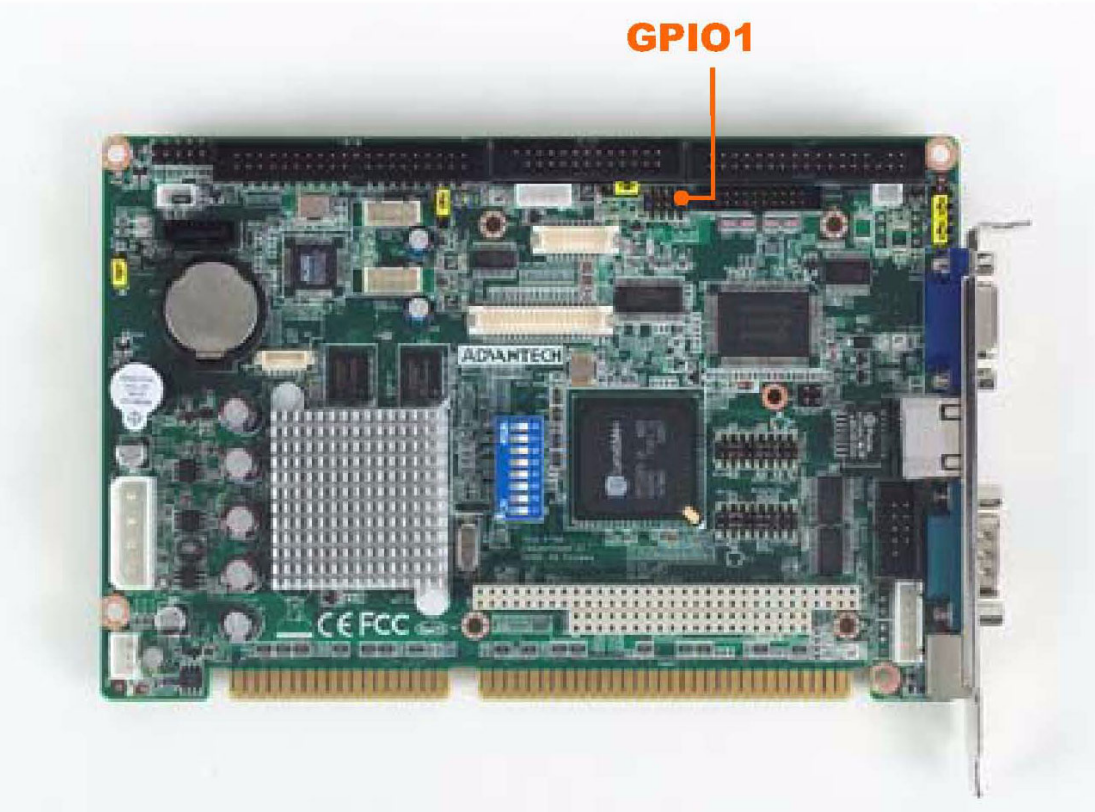
2.16 Power connector (PWR1)

If you prefer not to acquire power through the PCA-6743 backplane via the gold H-connectors, the big 4P power connector (PWR1) also provides power input connectors for +5 V, and +12 V.

2.17 GPIO Header (GPIO1)

Provides 10-Pins pin header for Digital I/O usage. Refer to Appendix A for detailed information on the pin assignments.

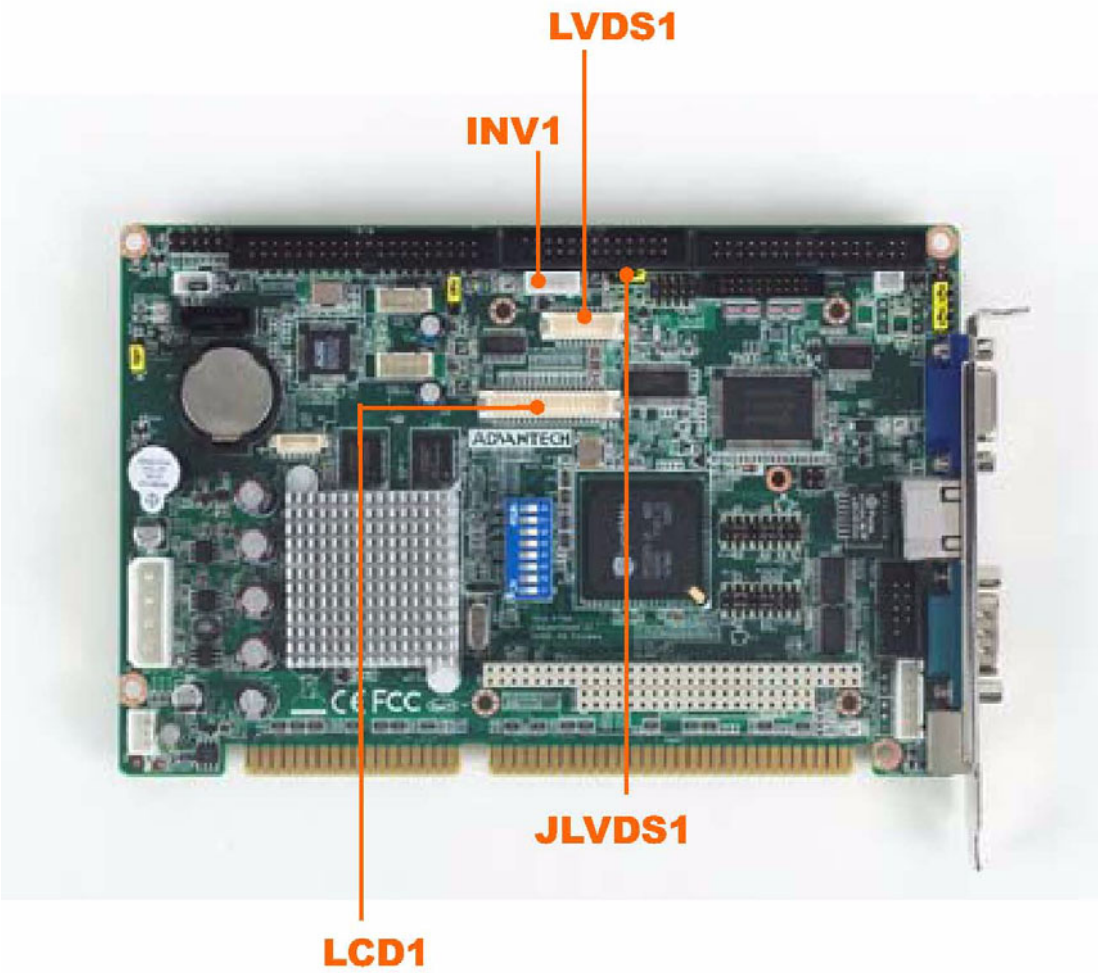
The board supports 8-bit GPIO through GPIO connector. The 8 digital in- and outputs can be programmed to read or control devices, with input or out- put defined. This GPIO is CMOS level (0 ~ 3.3V).



2.18 Flat Panel display connector (LCD1 & LVDS1)

The PCA-6743's VGA interface can drive conventional CRT displays and is capable of driving LVDS (optional) and TTL flat panel displays. The board has three connectors to support these displays: one for standard CRT VGA monitors, one for LVDS (optional) type LCD panels, another one for LVDS (optional) type LCD panels.

PCA-6743 uses SMI SM712 2D graphic Chip offering enhanced capabilities for dual view and for handling dual applications, CRT+TTL, and CRT +LVDS (optional), while dual independent display, each display can support independent full screen full motion video, as well as independent graphics refresh rates, resolutions, and color depths. LVDS (optional) and TTL can support resolutions of 640X480, 800X480, 800X600, and 1024X768.



2.18.1 TTL TFT LCD connector (LCD1)

For PCA-6743, LCD1 consists of a 40-pin connector which can support 1024x768 @ 18/24-bit TTL TFT LCD panel.

2.18.2 LVDS TFT LCD connector (LVDS1) (Optional)

For PCA-6743, LVDS1 consists of a 20-pin connector which can support 1024x768 @ 18/24-bit LVDS TFT LCD panel for optional.

2.19 Panel Inverter Power (INV1)

The LCD inverter is connected to INV1 via a 5-pin connector to provide +12 V power to the LCD display.

2.20 Low Pin Count Header (LPC1)

PCA-6743 provides 14-Pins pin header for LPC module. Refer to Appendix A for detailed information on the pin assignments. Here are the LPC modules that you can choose as accessory.

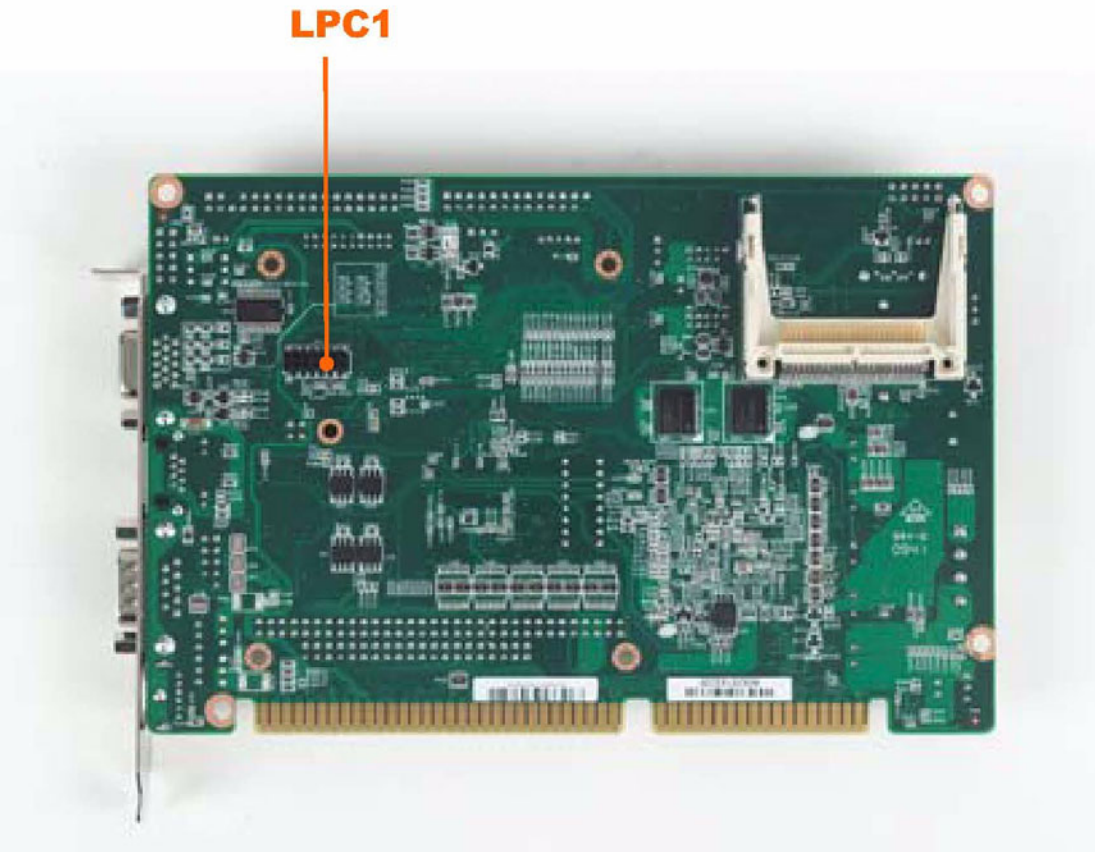


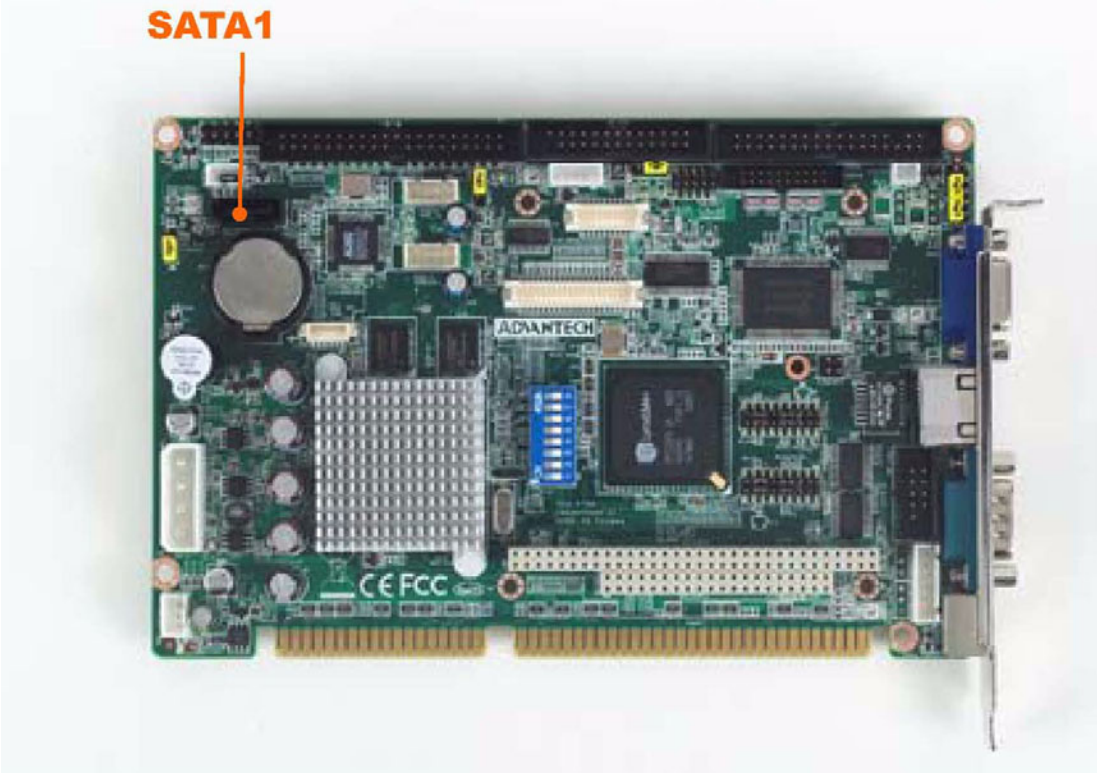
Table 2.9: LPC Module

Part Number	Description
PCA-COM485-00A1E	4 x RS- 422/485 COM module with auto-flow

Note! *Before add COM function by LPC Module; please check the IRQ resource available.*

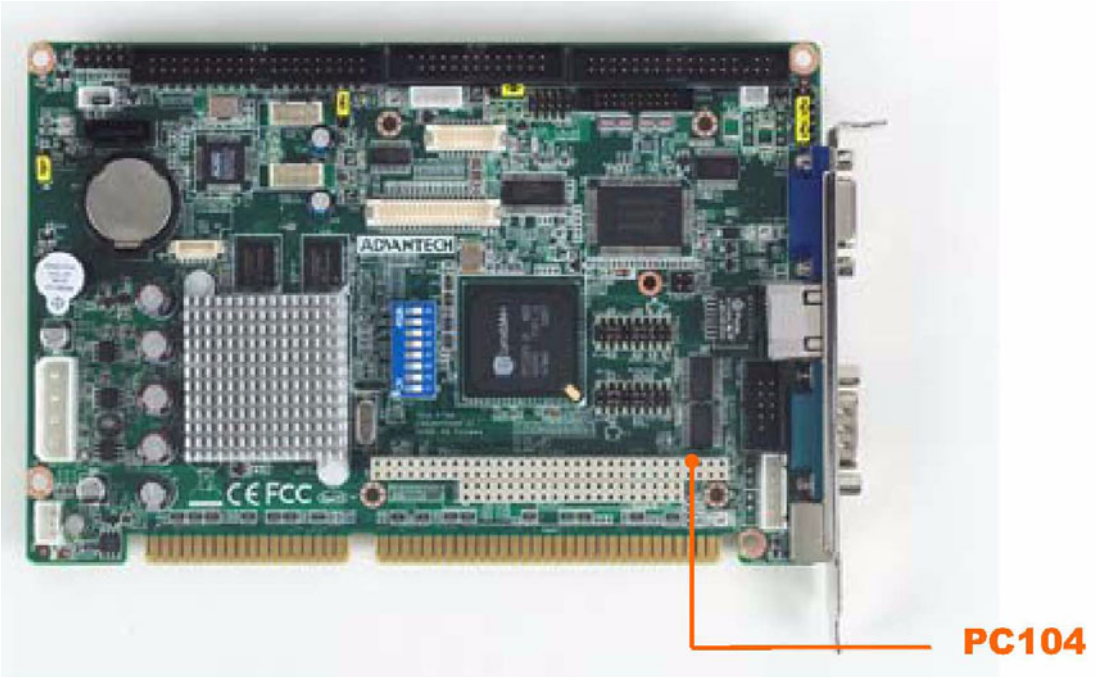
2.21 Serial ATA Interface (SATA1)

PCA-6743 (only F SKU) features a high performance one serial ATA interface (up to 150 MB/s) which eases cabling to hard drives with thin and long cables.



2.22 PC/104 connector (PC104)

The PCA-6743 is equipped with a 16-bit ISA signal PC/104 connector for future expansion.



Chapter 3

BIOS Operation

This chapter describes how to set BIOS configuration data.

3.1 BIOS Introduction

Advantech provide full-featured AwardBIOS 6.0 and delivers the superior performance, compatibility and functionality that manufactures of Industry PC and Embedded boards, it's many options and extensions let you customize your products to a wide range of designs and target markets.

The modular, adaptable AwardBIOS 6.0 supports the broadest range of third-party peripherals and all popular chipsets, plus Intel, AMD, nVidia, VIA, and compatible CPUs from 386 through Pentium and AMD Geode, K7 and K8 (including multiple processor platforms), and VIA Eden C3 and C7 CPU.

You can use Advantech's utilities to select and install features to suit your designs for customers need.

3.2 BIOS Setup

The PCA-6743 has build-in AwardBIOS with a CMOS SETUP utility which allows user to configure required settings or to activate certain system features.

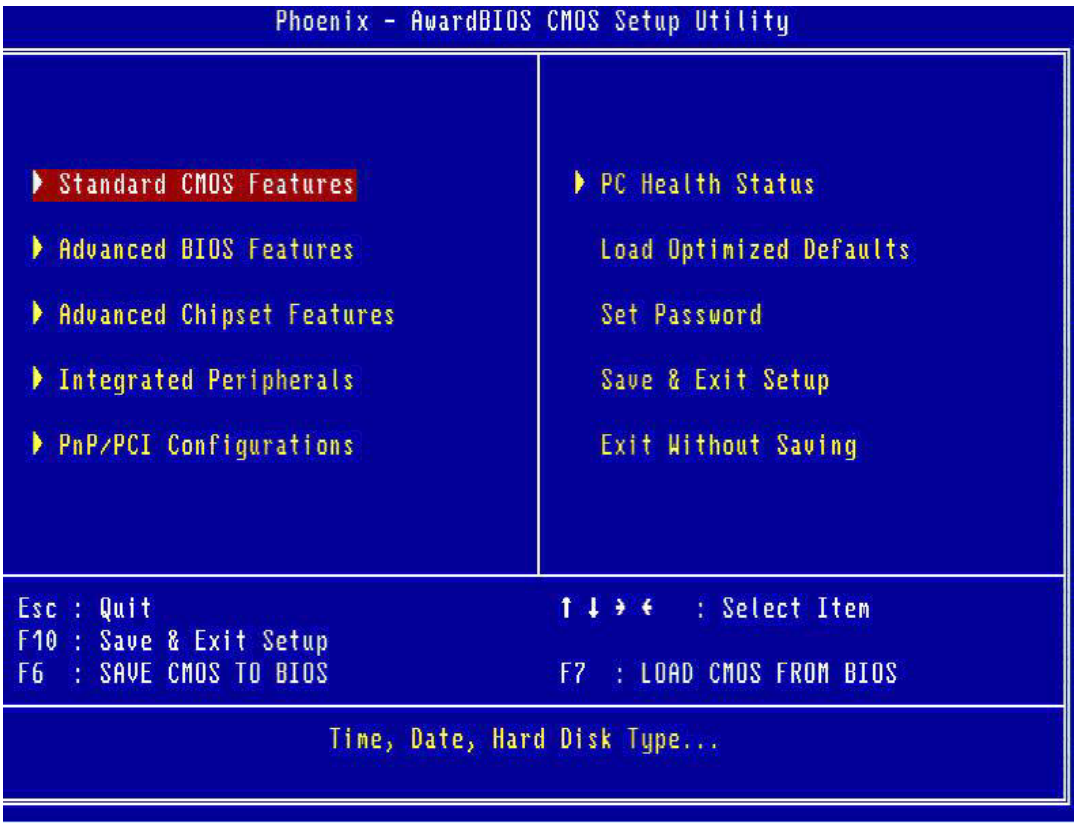
The CMOS SETUP saves the configuration in the CMOS RAM of the motherboard. When the power is turned off, the battery on the board supplies the necessary power to the CMOS RAM.

When the power is turned on, press the <Del> button during the BIOS POST (Power-On Self Test) will take you to the CMOS SETUP screen.

CONTROL KEYS	
< ↑ >< ↓ >< ← >< → >	Move to select item
<Enter>	Select Item
<Esc>	Main Menu - Quit without saving changes into CMOS Sub Menu - Exit current page and return to Main Menu
<Page Up/+>	Increase the numeric value or make changes
<Page Down/->	Decrease the numeric value or make changes
<F1>	General help, for Setup Sub Menu
<F2>	Item Help
<F5>	Load Previous Values
<F7>	Load Optimized Default
<F10>	Save all CMOS changes

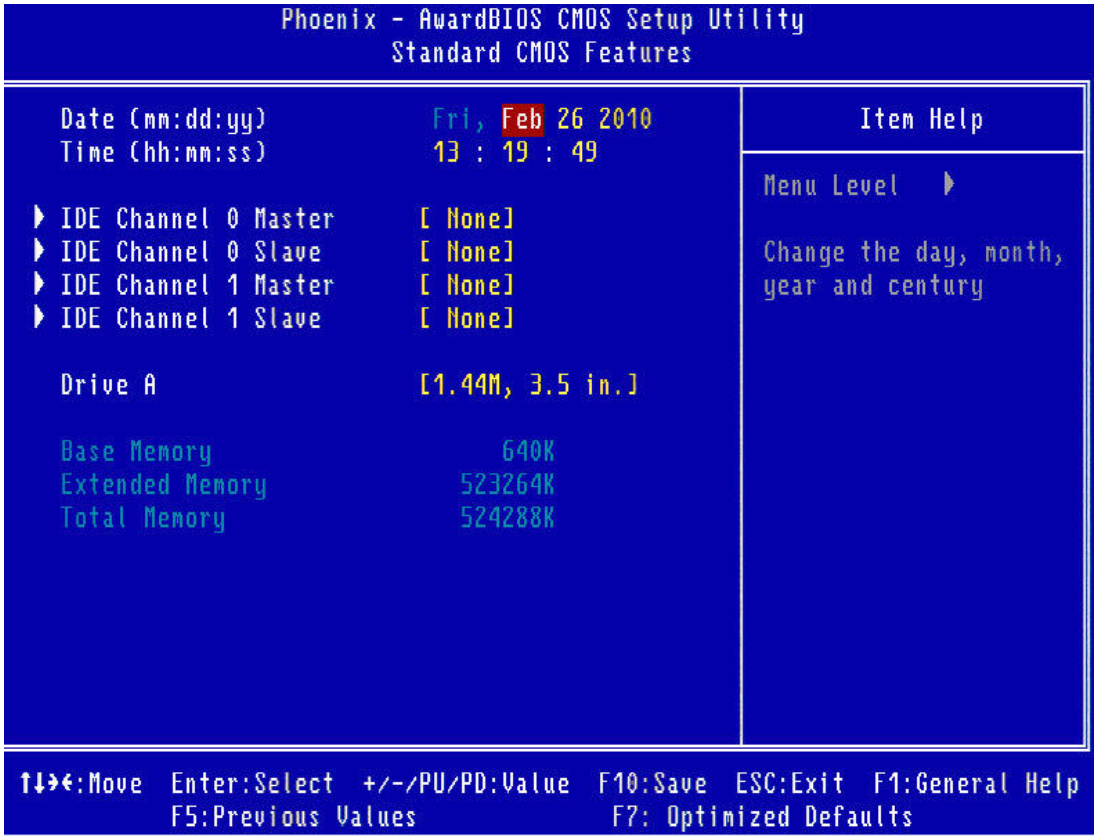
3.2.1 Main Menu

Press <Del> to enter AwardBIOS CMOS Setup Utility, the Main Menu will appear on the screen. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.



- **Standard CMOS Features**
  This setup page includes all the items in standard compatible BIOS.
- **Advanced BIOS Features**
  This setup page includes all the items of Award BIOS enhanced features.
- **Advanced Chipset Features**
  This setup page includes all the items of Chipset configuration features.
- **Integrated Peripherals**
  This setup page includes all onboard peripheral devices.
- **PnP/PCI Configurations**
  This item allows the user to change the Plug and Play and PCI resource setting, such as IRQ for VGA and USB.
- **PC Health Status**
  This item allows the user to monitor the system such as CPU, system temperature and voltage.
- **Load Optimized Defaults**
  This setup page includes Load system optimized value, and the system would be in best performance configuration.
- **Set Password**
  Establish, change or disable password.
- **Save & Exit Setup**
  Save CMOS value settings to CMOS and exit BIOS setup.
- **Exit Without Saving**
  Abandon all CMOS value changes and exit BIOS setup.

3.2.2 Standard CMOS Features



- **Date**

  The date format is <weekday>, <month>, <day>, <year>.

Weekday	From Sun to Sat, determined and displayed by BIOS only
Month	From Jan to Dec.
Day	From 1 to 31
Year	From 1999 through 2098

- **Time**

  The times format in <hour> <minute> <second>, base on the 24-hour time

- **IDE Channel 0 Master/Slave**

  IDE HDD Auto-Detection Press "Enter" for automatic device detection.

- **IDE Channel 1 Master/Slave**

  IDE HDD Auto-Detection Press "Enter" for automatic device detection.

- **Drive A**

  The Item identifies the types of floppy disk drive A.

None	No floppy drive installed
360K, 5.25"	5.25 inch PC-type standard drive; 360 K byte capacity
1.2M, 5.25"	5.25 inch AT-type high-density drive; 1.2 M byte capacity
720K, 3.5"	3.5 inch double-sided drive; 720 K byte capacity
1.44M, 3.5"	3.5 inch double-sided drive; 1.4 4M byte capacity
2.88M, 3.5"	3.5 inch double-sided drive; 2.88 M byte capacity.

- **Base Memory**

  The POST of the BIOS will determine the amount of base (or conventional) memory installed in the system.

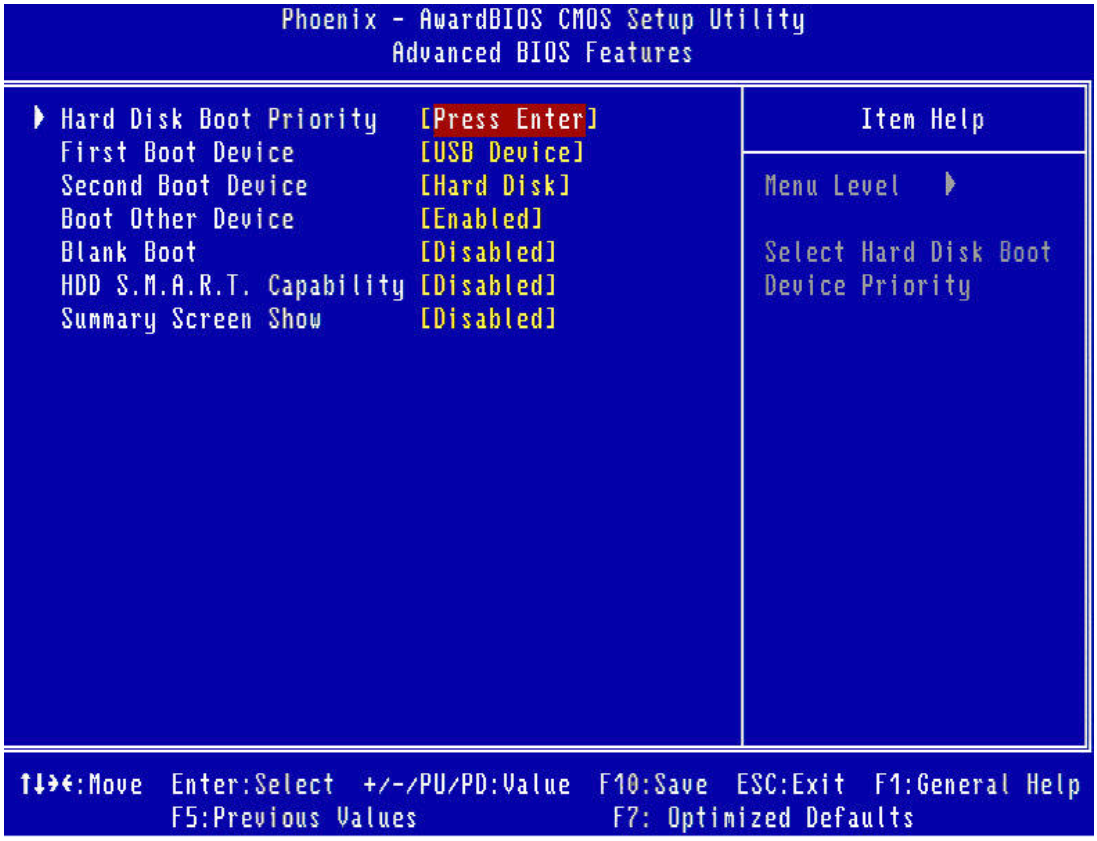
- **Extended Memory**

  The POST of the BIOS will determine the amount of extended memory (above 1MB in CPU's memory address map) installed in the system.

- **Total Memory**

  This item displays the total system memory size.

3.2.3 Advanced BIOS Feature

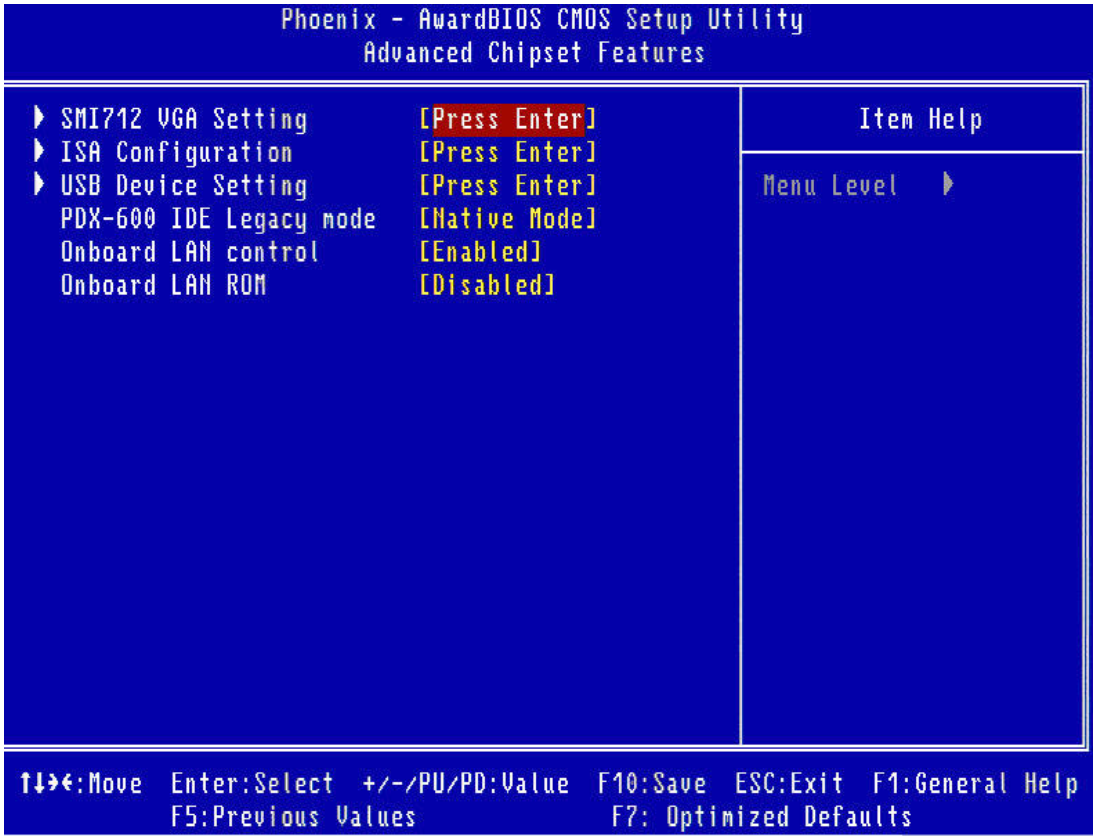


- **Hard Disk Boot Priority [Press Enter]**
  This item allows user to choose the bootable Hard Drive.
- **First / Second / Boot Other Device**

Floppy	Set floppy boot priority.
Hard Disk	Set hard disk boot priority.
CDROM	Set CDROM boot priority.
USB-Device	Set USB-devic boot priority.
USB-FDD	Set USB-FDD boot priority.
USB-ZIP	Set USB-ZIP boot priority.
USB-CDROM	Set USB-CDROM boot priority.
LAN	Set LAN boot priority.
Disabled	Disable this boot function.

- **Blank Boot [Disabled]**
  This item enable/disable Blank Boot feature.
- **Console Redirection [Disabled]**
  This item allows a user to enable / disable console redirection mode.
- **HDD S.M.A.R.T. Capability [Disable]**
  This item allows a user to enable / disable HDD with smart function support.
- **Summary Screen Show [Disabled]**
  Show all Mother Board information on POST.

3.2.4 Advanced Chipset Features



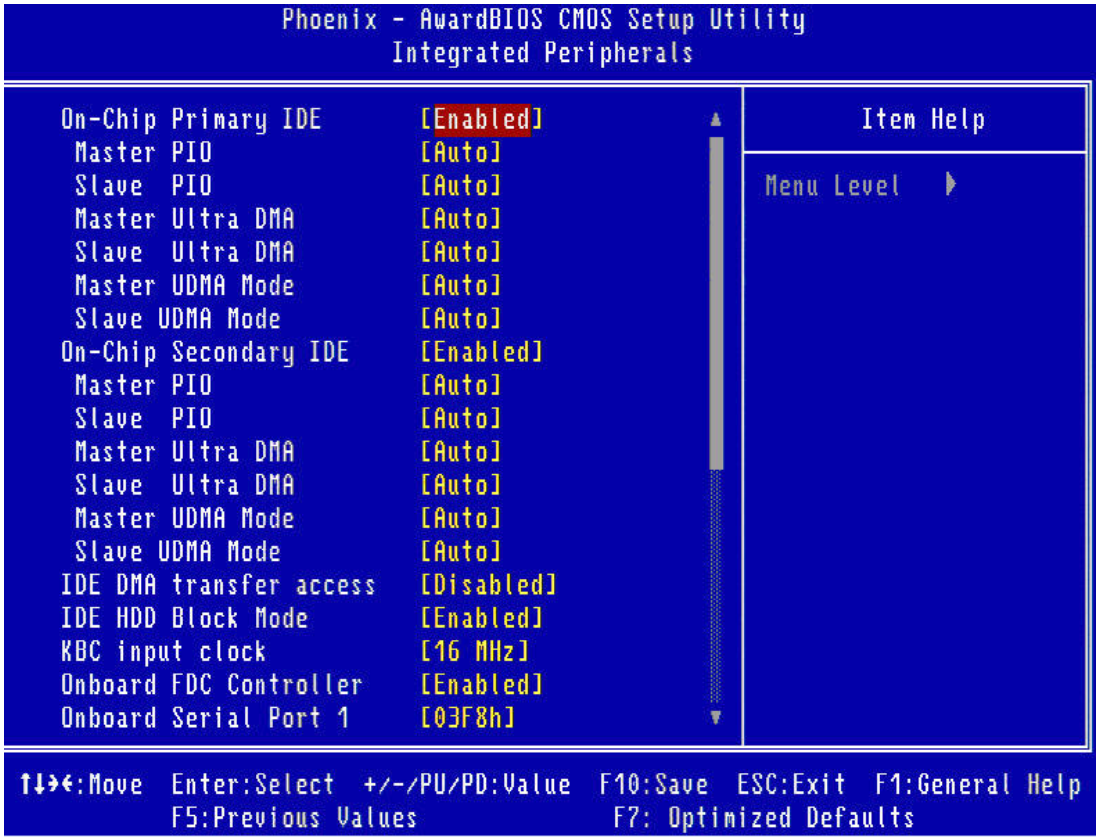
Note! *This "Advanced Chipset Features" page controls configuration of the board's chipset; this page is chipset dependent. Use it to control chipset register settings and fine tune system performance. It is strongly recommended only technical users make changes to the default settings.*

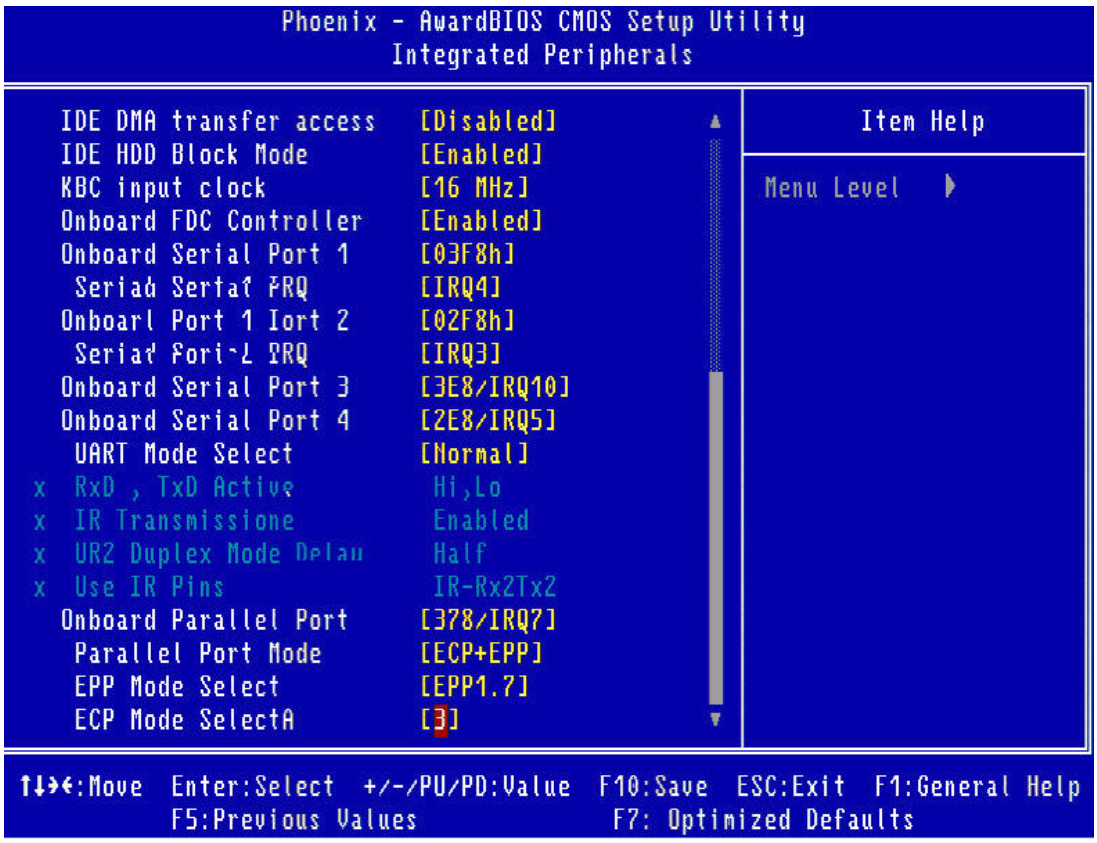
- **SMI712 VGA Setting [Press Enter]**
  This item allows a user to set VGA related features.
- **ISA Configuration [Press Enter]**
  This item allows users to config ISA resources & IO/MEM wait state.
- **USB Device Setting [Press Enter]**
  This item allows users to set USB related features.
- **PDX-600 IDE Legacy mode [Legacy Mode]**
  This item enables Vortex86DX SOC IDE as legacy or native mode.

Note! *Please set PDX-600 IDE Legacy mode to [Native Mode], While you install Windows XP or Windows XP embedded.*

- **Onboard LAN Control [Enabled]**
  This item is enabled or disabled that onboard of LAN controller.
- **Onboard LAN ROM [Disabled]**
  This item allows user to choose the way that LAN boot ROM work

3.2.5 Integrated Peripherals





Note! *This "Integrated Peripherals" option controls the configuration of the board's chipset, includes IDE, ATA. This page is chipset dependent.*

- **On-Chip Primary/Secondary IDE**
  This item enables chipset IDE device 1 of controller.
- **Master PIO [Auto]**
  This item allows user to adjust master IDE mode of type for modification purpose. Bios default value suggest to “Auto”.
- **Slave PIO [Auto]**
  This item allows user to adjust slave IDE mode of type for modification purpose. Bios default value suggest to “Auto”.
- **Master Ultra DMA [Enabled]**
  This item allows user to enable/disable primary master IDE ultra DMA mode. Bios default value suggest to “Enabled”.
- **Slave Ultra DMA [Enabled]**
  This item allows user to enable/disable primary slave IDE ultra DMA mode. Bios default value suggest to “Enabled”.
- **Master UDMA Mode [Auto]**
  This item allows user to adjust primary master IDE mode of type for modification purpose. Bios default value suggest to “Auto”.
- **Slave UDMA Mode [Auto]**
  This item allows user to adjust primary slave IDE mode of type for modification purpose. BIOS default value suggest to “Auto”.
- **IDE DMA transfer access [Disabled]**
  This item allows user to adjust IDE DMA mode. It will increase IDE Data transfer of speed. BIOS default value suggest to "Enabled".
- **IDE HDD Block Mode [Enabled]**
  This item allows enabled or disabled that IDE block data transfer mode. It will speed up HDD data transfer of efficiency. BIOS default value suggest to "Enabled".
- **KBC input clock [8 MHz]**
  PS/2 keyboard communicates with the keyboard controller. The speed of the data link depends on the clock signal generated by the keyboard controller.
- **Onboard FDC Controller [Enabled]**
  This item allows user to enabled or disabled chipset FDD controller.
- **Onboard Serial Port 1 [03F8 / IRQ4]**
  This item allows user to change COM 1 address and IRQ.
- **Onboard Serial Port 2 [02F8 / IRQ3]**
  This item allows user to change COM 2 address and IRQ.
- **Onboard Serial Port 3 [03E8 / IRQ10]**
  This item allows user to change COM 3 address and IRQ.
- **Onboard Serial Port 4 [02E8 / IRQ5]**
  This item allows user to change COM 4 address and IRQ.
- **UART Mode select [Normal]**
  This item allows you to select UART mode.
- **RxD, TxD Active [Hi, Lo]**
  This item allows you to determine the active of RxD, TxD.
- **IR Transmission Delay [Enabled]**
  This item allows you to enable or disable IR transmission delay.
- **UR2 Duplex Mode [Half]**
  This item allows you to select the IR half/full duplex function.

- **Onboard Parallel Port [378 / IRQ7]**

  This field sets the address of the on-board parallel port connector. You can select either Auto, 3BCH/IRQ7, 378H/IRQ7, 278H/IRQ5 or Disabled. If you install an I/O card with a parallel port, make sure there is no conflict in the address assignments. The CPU card can support up to three parallel ports, as long as there are no conflicts for each port.

- **Parallel Port Mode [ECP+EPP]**

  This field allows you to set the operation mode of the parallel port. The setting "SPP" 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 bi-directional mode and at a speed faster than the maximum data transfer rate. "ECP + EPP" allows normal speed operation in a two-way mode

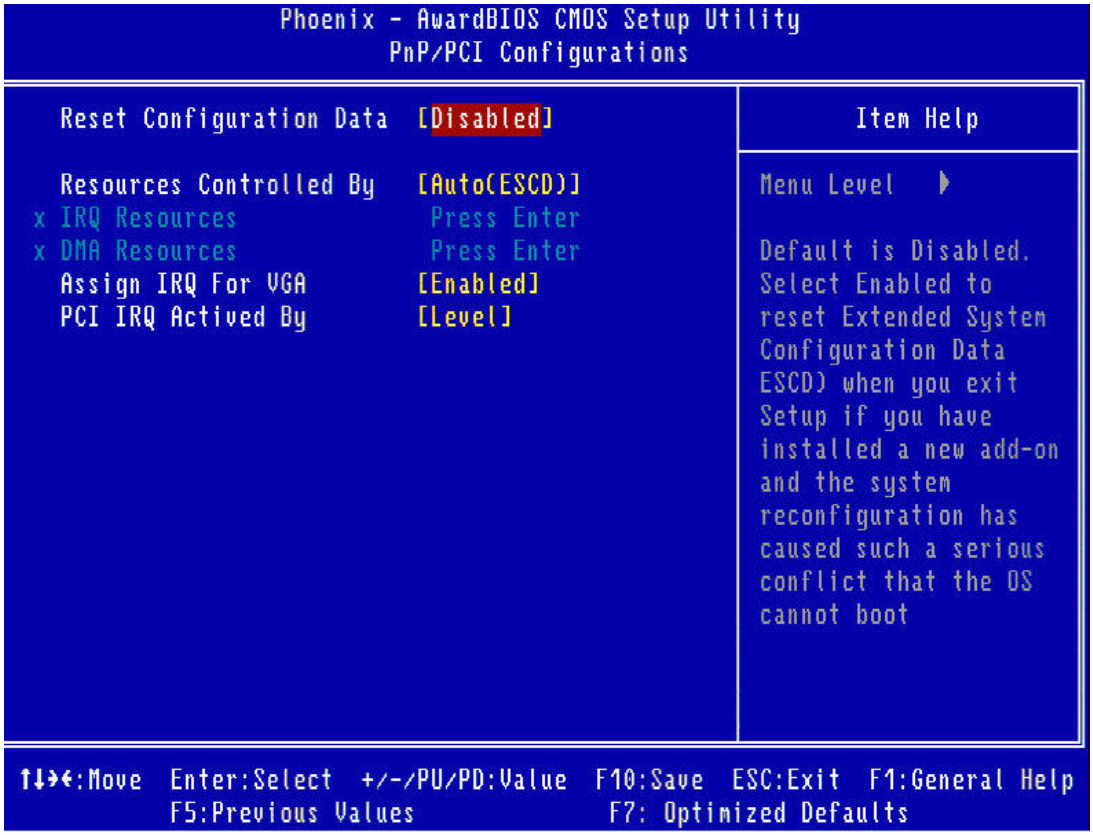
- **EPP Mode Select [EPP1.7]**

  This field allows you to select EPP port type 1.7 or 1.9.

- **ECP Mode Use DMA [3]**

  This selection is available only if you select "ECP" or "ECP + EPP" in the Parallel Port Mode field. In ECP Mode Use DMA, you can select DMA channel 1, DMA channel 3, or Disable. Leave this field on the default setting.

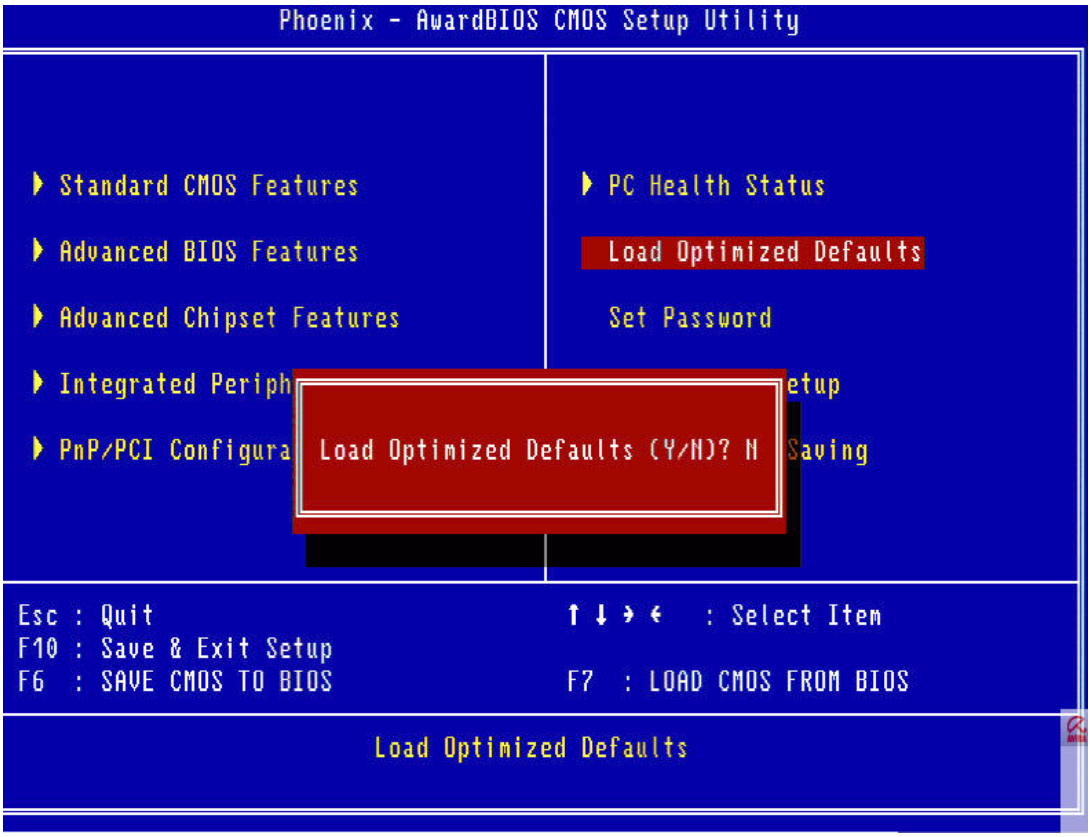
3.2.6 PnP/PCI Configurations



Note! *This "PnP/PCI Configurations" option is setting up the IRQ and DMA (both PnP and PCI bus assignments).*

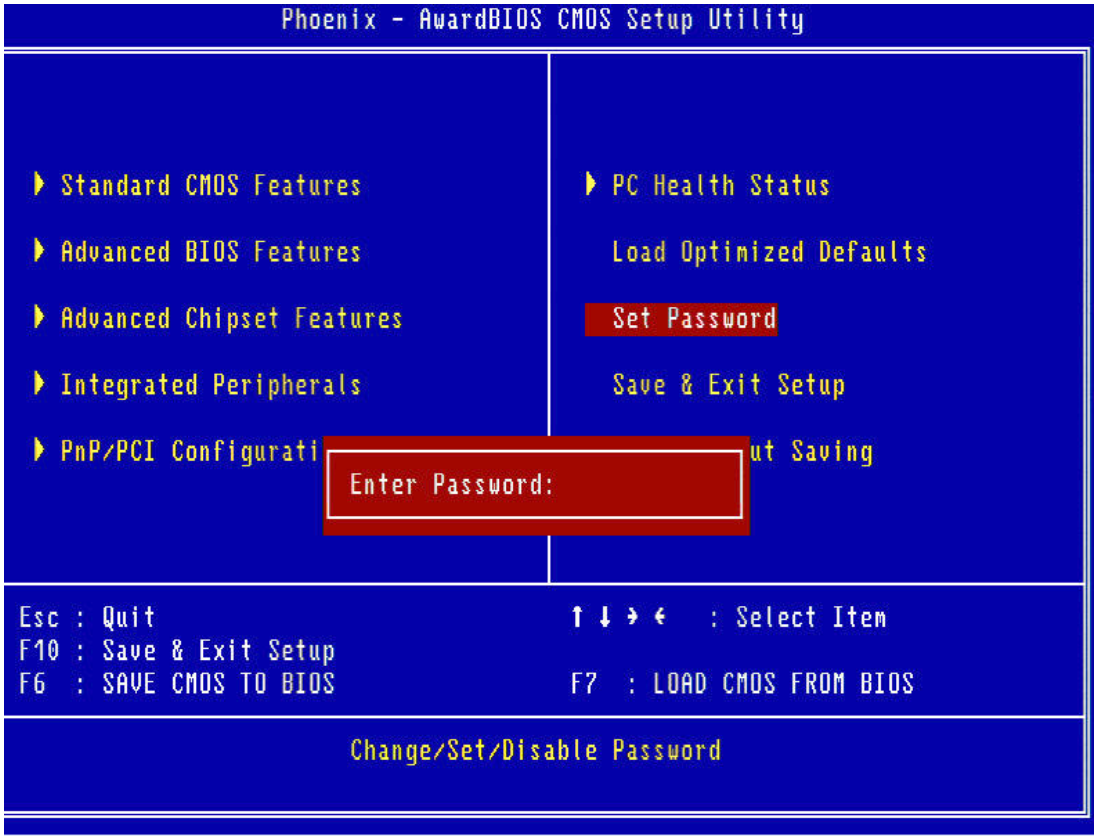
- **Reset Configuration Data° [Disabled]**
  This item allow user to clear any PnP configuration data stored in the BIOS.
- **Resources Controlled By [Auto (ESCD)]**
  – IRQ Resources
  This item allows you respectively assign an interruptive type for IRQ-9, 10, 11, 14, and 15.
  – DMA Resources
  This item allows you respectively assign a DMA for 0, 1, 3, 5, 6, and 7.
- **Assign IRQ For VGA [Enabled]**
  The item is designed to solve problems caused by some non-standard VGA cards. A built-in VGA system does not need this function.
- **PCI IRQ Actived By [Level]**
  The item allows users to choose level or edge.

3.2.7 Load Optimized Defaults



Note! *Load Optimized Defaults loads the default system values directly from ROM. If the stored record created by the Setup program should ever become corrupted (and therefore unusable), these defaults will load automatically when you turn the PCA-6743 Series system on.*

3.2.8 Set Password



Note! *To enable this feature, you should first go to the Advanced BIOS Features menu, choose the Security Option, and select either Setup or System, depending on which aspect you want password protected. Setup requires a password only to enter Setup. System requires the password either to enter Setup or to boot the system. A password may be at most 8 characters long.*

To Establish Password

1. Choose the Set Password option from the CMOS Setup Utility main menu and press <Enter>.
2. When you see "Enter Password", enter the desired password and press <Enter>.
3. At the "Confirm Password" prompt, retype the desired password, and then press <Enter>.
4. Select Save to CMOS and EXIT, type <Y>, then <Enter>.

To Change Password

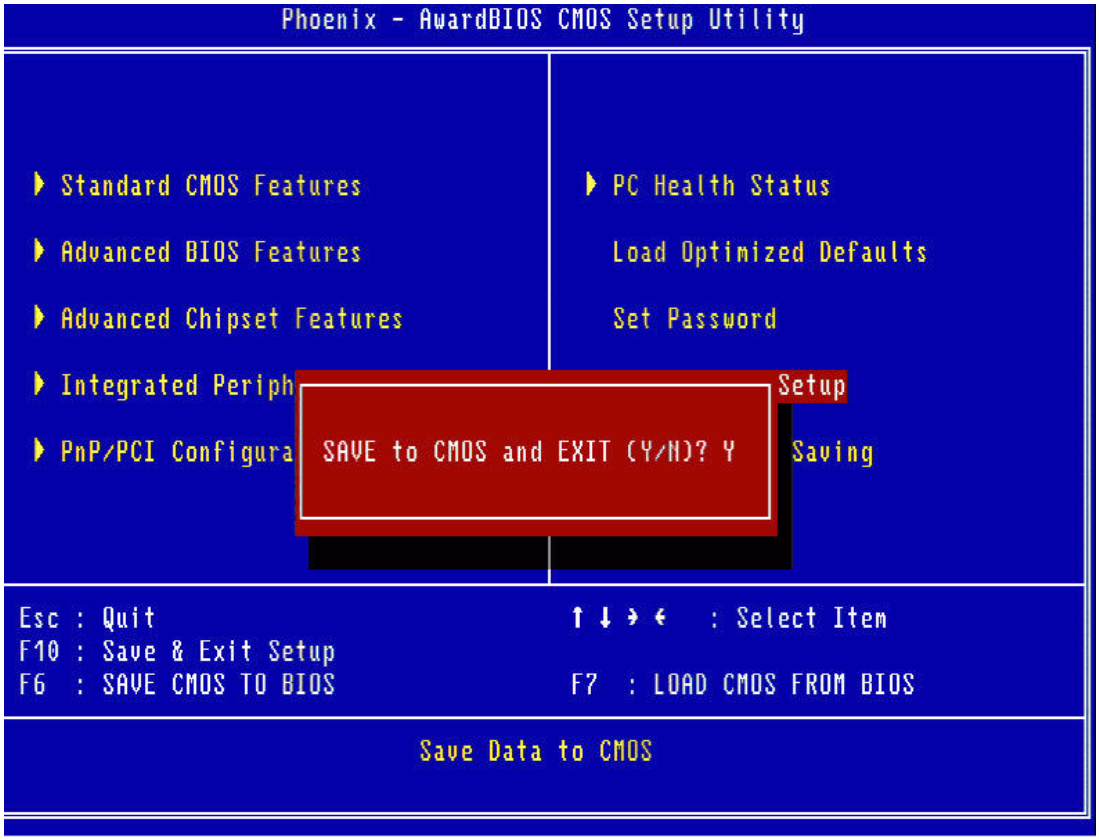
1. Choose the Set Password option from the CMOS Setup Utility main menu and press <Enter>.
2. When you see "Enter Password", enter the existing password and press <Enter>.
3. You will see "Confirm Password". Type it again, and press <Enter>.
4. Select Set Password again, and at the "Enter Password" prompt, enter the new password and press <Enter>.

5. At the "Confirm Password" prompt, retype the new password, and press <Enter>.
6. Select Save to CMOS and EXIT, type <Y>, then <Enter>.

To Disable Password

1. Choose the Set Password option from the CMOS Setup Utility main menu and press <Enter>.
2. When you see "Enter Password", enter the existing password and press <Enter>.
3. You will see "Confirm Password". Type it again, and press <Enter>.
4. Select Set Password again, and at the "Enter Password" prompt, please don't enter anything; just press <Enter>.
5. At the "Confirm Password" prompt, again, don't type in anything; just press <Enter>.
6. Select Save to CMOS and EXIT, type <Y>, then <Enter>.

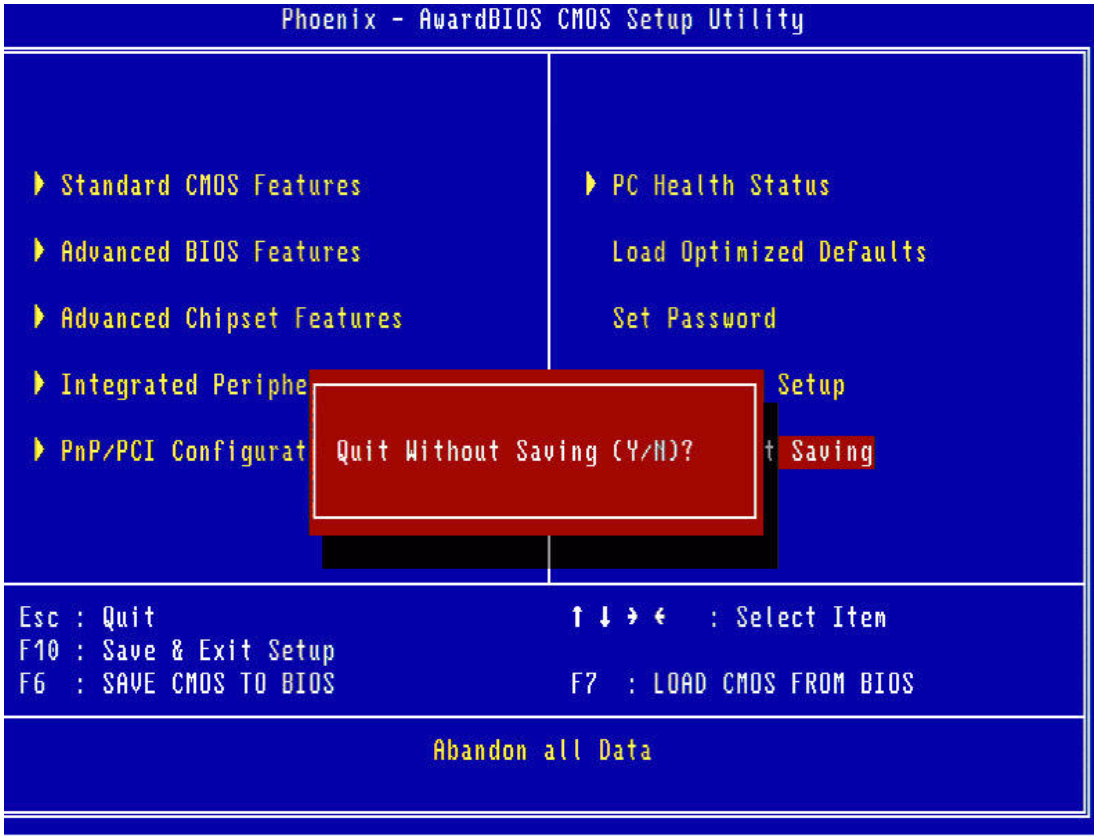
3.2.9 Save & Exit Setup



Note! *Typing "Y" will quit the BIOS Setup Utility and save user setup value to CMOS.*

Typing "N" will return to BIOS Setup Utility.

3.2.10 Quit Without Saving



Note! *Typing "Y" will quit the BIOS Setup Utility without saving to CMOS. Typing "N" will return to BIOS Setup Utility.*

Appendix A

Pin Assignments

This appendix contains information of a detailed or specialized nature.

A.1 Front Panel Connectors (JFP1)

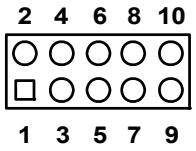


Table A.1: Front Panel Connectors (JFP1)	
Pin	**Signal**
1	HDD LED+
2	HDD LED-
3	Power LED+
4	Power LED-
5	N/C
6	N/C
7	Reset Switch
8	GND
9	5 VSB (Reserved)
10	Power Switch (Reserved)

A.2 USB Ports (USB12 & USB34)

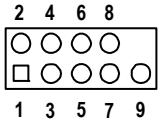


Table A.2: USB Ports (USB12 & USB34)	
Pin	**Signal**
1	VCC
2	VCC
3	USB Data1-
4	USB Data2-
5	USB Data1+
6	USB Data2+
7	GND
8	GND
9	GND

A.3 Serial Ports (COM2)

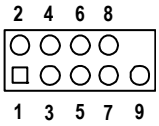


Table A.3: Serial Ports (COM2)			
Pin	**Signal**		
	RS232	**RS422**	**RS485**
1	DCD	TXD-	Data-
2	DSR	NC	NC
3	RX	TXD+	Data+
4	RTS	NC	NC
5	TX	RXD+	NC
6	CTS	NC	NC
7	DTR	RXD-	NC
8	RI	NC	NC
9	GND	GND	GND

A.4 Serial Ports (COM34)

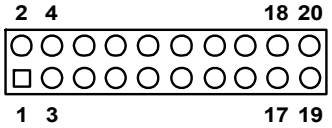


Table A.4: Serial Ports (COM34)			
Pin	**Signal**	**Pin**	**Signal**
1	DCD3	2	DSR3
3	RX3	4	RTS3
5	TX3	6	CTS3
7	DTR3	8	RI3
9	GND	10	GND
11	DCD4	12	DSR4
13	RX4	14	RTS4
15	TX4	16	CTS4
17	DTR4	18	RI4
19	GND	20	GND

A.5 PS/2 Keyboard / Mouse connector (KBMS2)

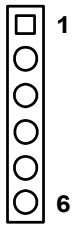


Table A.5: PS/2 Keyboard / Mouse connector (KBMS2)	
Pin	**Signal**
1	PS2 keyboard clock
2	PS2 keyboard data
3	PS2 mouse data
4	GND
5	VCC
6	PS2 mouse clock

A.6 Front Panel LAN Indicate connector (LANLED1)

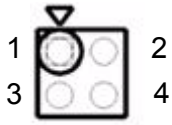


Table A.6: Front Panel LAN Indicate connector (LANLED1)	
Pin	**Signal**
1	LAN_/ACTIVITY#
2	LAN1_100#
3	NC
4	NC

A.7 System FAN connector (SYSFAN1)

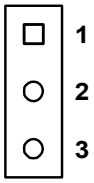


Table A.7: System FAN connector (SYSFAN1)	
Pin	**Signal**
1	GND
2	+12 V
3	FAN_TACH

A.8 GPIO Header (GPIO1)

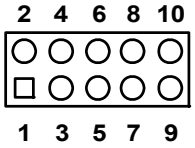


Table A.8: GPIO Header (GPIO1)			
Pin	**Signal**	**Pin**	**Signal**
1	GPIO1	2	GPIO5
3	GPIO2	4	GPIO6
5	GPIO3	6	GPIO7
7	GPIO4	8	GPIO8
9	VCC	10	GND

A.9 TTL TFT LCD connector (LCD1)

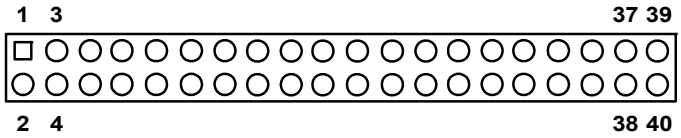


Table A.9: TTL TFT LCD connector (LCD1)			
Pin	**Signal**	**Pin**	**Signal**
1	VCC5	2	VCC5
3	GND	4	GND
5	VCC3	6	VCC3
7	Vcon	8	GND
9	LCD_DATA0	10	LCD_DATA1
11	LCD_DATA2	12	LCD_DATA3
13	LCD_DATA4	14	LCD_DATA5
15	LCD_DATA6	16	LCD_DATA7
17	LCD_DATA8	18	LCD_DATA9
19	LCD_DATA10	20	LCD_DATA11
21	LCD_DATA12	22	LCD_DATA13
23	LCD_DATA14	24	LCD_DATA15
25	LCD_DATA16	26	LCD_DATA17
27	LCD_DATA18	28	LCD_DATA19
29	LCD_DATA20	30	LCD_DATA21
31	LCD_DATA22	32	LCD_DATA23
33	GND	34	GND
35	LCD_SCLK	36	LCD_VSYNC
37	LCD_DE	38	LCD_HSYNC
39	NC	40	LCD_BACKON

A.10 LVDS TFT LCD connector (LVDS1)

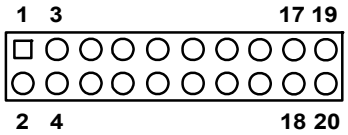


Table A.10: LVDS TFT LCD connector (LVDS1)			
Pin	**Signal**	**Pin**	**Signal**
1	VCC3	2	VCC3
3	GND	4	GND
5	LVDS_TX0-	6	LVDS_TX0+
7	GND	8	LVDS_TX1-
9	LVDS_TX1+	10	GND
11	LVDS_TX2-	12	LVDS_TX2+
13	GND	14	LVDS_TX3-
15	LVDS_TX3+	16	GND
17	LVDS_CLK-	18	LVDS_CLK+
19	GND	20	GND

A.11 Inverter power connector (INV1)

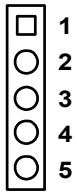


Table A.11: Inverter power connector (INV1)	
Pin	**Signal**
1	+12 V
2	GND
3	BACK_ON#
4	Brightness
5	VCC

Appendix B

Programming the Watchdog Timer

This appendix contains information of how to program the Watchdog Timer.

B.1 Introduction

The PCA-6743'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.

B.1.1 Watchdog timer overview

The watchdog timer is built in to the W83627HG 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

B.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).

B.1.3 Example Program

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

```
;--------------------------------------------------------
Mov     dx, 2Eh; Unlock W83627DHG
Mov     al, 87h
Out     dx, al
Out     dx, al
;--------------------------------------------------------
Mov     dx, 2Eh; Pin 77 Select as WDTO#
Mov     al, 2Dh
Out     dx, al
Inc     dx
In      al, dx
And     al, not 00000001b
Out     dx, al
;--------------------------------------------------------
Mov     dx, 2Eh; Select Logical Device 8 of watchdog timer
Mov     al, 07h
Out     dx, al
Inc     dx
Mov     al, 08h
Out     dx, al
;--------------------------------------------------------
Mov     dx, 2Eh; Enable the function of watchdog timer
Mov     al, 30h
Out     dx, al
Inc     dx
Mov     al, 01h
Out     dx, al
;--------------------------------------------------------
Mov     dx, 2Eh ; Set second as counting unit
Mov     al, F5h
Out     dx, al
Inc     dx
In      al, dx
And     al, not 08h
Out     dx, al
;--------------------------------------------------------
Mov     dx, 2Eh ; Set timeout interval as 10 seconds and start counting
Mov     al, F6h
Out     dx, al
Inc     dx
Mov     al,10
Out     dx, al
;--------------------------------------------------------
Mov     dx, 2Eh; Lock W83627DHG
Mov     al, AAh
```

```
Out     dx, al
```

2. Enable watchdog timer and set 5 minutes as timeout interval

```
;--------------------------------------------------------
Mov     dx,2Eh; Unlock W83627DHG
Mov     al, 87h
Out     dx, al
Out     dx, al
;--------------------------------------------------------
Mov     dx, 2Eh; Pin 77 Select as WDTO#
Mov     al, 2Dh
Out     dx, al
Inc     dx
In      al, dx
And     al, not 00000001b
Out     dx, al
;--------------------------------------------------------
Mov     dx,2Eh; Select Logical Device 8 of watchdog timer
Mov     al, 07h
Out     dx, al
Inc     dx
Mov     al, 08h
Out     dx, al
;--------------------------------------------------------
Mov     dx, 2Eh; Enable the function of watchdog timer
Mov     al, 30h
Out     dx, al
Inc     dx
Mov     al, 01h
Out     dx, al
;--------------------------------------------------------
Mov     dx, 2Eh; Set minutes as counting unit
Mov     al, F5h
Out     dx, al
Inc     dx
In      al, dx
Or      al, 08h
Out     dx, al
;--------------------------------------------------------
Mov     dx, 2Eh; Set timeout interval as 5 minutes and start counting
Mov     al, F6h
Out     dx, al
Inc     dx
Mov     al, 5
Out     dx, al
;--------------------------------------------------------
Mov     dx, 2Eh; Lock W83627DHG
Mov     al, AAh
Out     dx, al
```

Appendix C

System Assignments

This appendix contains information of all System assignments.

C.1 System I/O ports

Table C.1: System I/O ports

Addr. Range(Hex)	Device
00-0F	Slave DMA Controller Registers
20-21	Master Interrupt Controller Registers
22-23	Indirect Access Registers
40-43	Timer / Counter Registers
48-4B	PWM Control Registers
60/64	Keyboard / Mouse Control Resisters
61	NMI status and Control Register
68-6D	Watchdog Timer 1 Control Register
65/67	Watchdog Timer Reload Register
70-71	CMOS Memory & RTC Registers
72-75	MTBF Registers
81/82/83/87/89/8A/8B	DMA page Registers
92	System Control Register
A0-A1	Slave Interrupt Controller Registers
C0/C2/C4/C6/C8/CA/ CC/CE/D0/D2/D4/D6/ D8/DA/DC/DE	DMA controller
F0	Clear math co-processor
F1	Reset math co-processor
F8-FF	Math co-processor
170- 177	2nd Fixed Disk for CompactFlash
1F0-1F7	1st Fixed Disk
220-227	Serial Port 5
228-22F	Serial Port 6
238-23F	Serial Port 7
278-27F	Parallel Port
2E8-2EF	Serial Port 4
2F8-2FF	Serial Port 2
338-33F	Serial Port 8
378-37F	Parallel Port
3B0-3BF	Monochrome display
3C0-3CF	Reserved
3D0-3DF	Color / Graphics monitor adapter
3E8-3EF	Serial port 3
3F0-3F7	Diskette controller
3F8-3FF	Serial port 1
481-483/487/489/48A/ 48B	DMA High page Registers
490-499	Instruction Counter Registers
4D0-4D1	Interrupt Edge / Level control Registers

C.2 DMA Channel assignments

Table C.2: DMA Channel assignments

Channel	Function
0	Available
1	Available
2	Reserved
3	Parallel
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

C.3 Interrupt assignments

Table C.3: Interrupt assignments

Interrupt#	Interrupt source
NMI	Parity error detected
IRQ 0	Interval timer
IRQ 1	Keyboard
IRQ 2	Interrupt from controller 2 (cascade)
IRQ 8	Real-time clock
IRQ 9	Available/Serial Port 6
IRQ 10	Serial Port 3/Serial Port 7
IRQ 11	Available/Serial Port 8
IRQ 12	PS/2 mouse
IRQ 13	INT from co-processor
IRQ 14	Primary IDE
IRQ 15	Secondary IDE for CompactFlash
IRQ 3	Serial Port 2
IRQ 4	Serial Port 1
IRQ 5	Serial Port 4/Serial Port 5
IRQ 6	Floppy Disk
IRQ 7	Parallel port 1 (print port)

C.4 1st MB Memory map

Table C.4: 1st MB Memory map

Addr. range (Hex)	Device
E800 - FFFF	BIOS Area
D400 - E7FF	Available
CC00 - D3FF	Legacy USB
C000h - CBFFh	VGA BIOS
B800h - BFFFh	CGA/EGA/VGA text
B000h - B7FFh	Reserved for graphic mode usage
A000h - AFFFh	EGA/VGA graphics
0000h - 9FFFh	Base memory

Appendix D

Installing PC/104 Modules

This appendix contains information of installing PC/104 modules.

D.1 Introduction

The PCA-6743 PC/104 connectors give you the flexibility to attach PC/104 modules.

Installing these modules on the PCA-6743 is quick and simple. The following steps show how to mount the PC/104 modules:

1. Remove the PCA-6743 from your system, paying particular attention to the safety instructions already mentioned above.
2. Make any jumper or link changes required to the CPU card now. Once the PC/104 module is mounted you may have difficulty in accessing these.
3. Normal PC/104 modules have male connectors and mount directly onto the main card. (Refer to the diagram on the following page.)
4. Mount the PC/104 module onto the CPU card by pressing the module firmly but carefully onto the mounting connectors.
5. Secure the PC/104 module onto the CPU card using the four mounting spacers and screws.

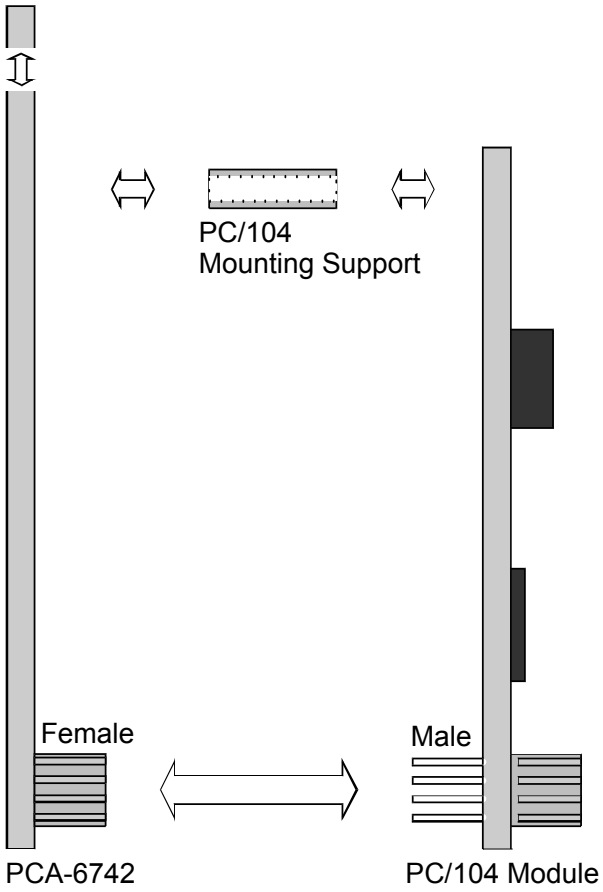


Figure D.1 PC/104 module mounting diagram

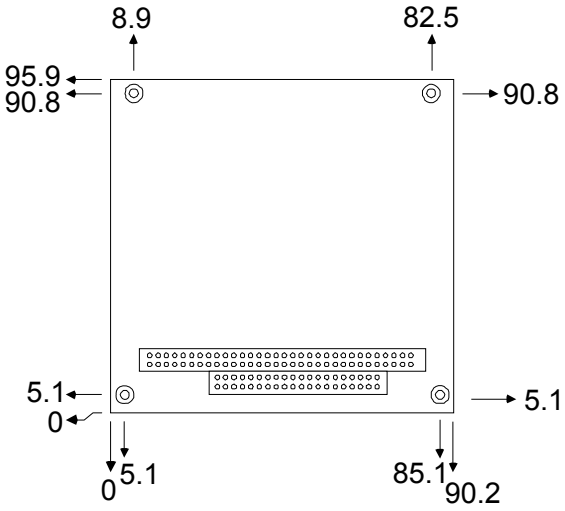


Figure D.2 PC/104 module dimensions (mm) (± 0.1)

Pin Number	Signal Row A	Signal Row B	Row C	Row D
0	-	-	0 V	0 V
1	IOCHCHK*	0 V	SBHE*	MEMCS16*
2	SD7	RESETDRV	LA23	IOCS16*
3	SD6	+5 V	LA22	IRQ10
4	SD5	IRQ9	LA21	IRQ11
5	SD4	-5 V	LA20	IRQ12
6	SD3	DRQ2	LA19	IRQ15
7	SD2	-12 V	LA18	IRQ14
8	SD1	ENDXFR*	LA17	DACK0*
9	SD0	+12 V	MEMR*	DRQ0
10	IOCHRDY	N/C	MEMW*	DACK5*
11	AEN	SMEMW*	SD8	DRQ5
12	SA19	SMEMR*	SD9	DACK6*
13	SA18	IOW*	SD10	DRQ6
14	SA17	IOR*	SD11	DACK7*
15	SA16	DACK3*	SD12	DRQ7
16	SA15	DRQ3	SD13	+5 V
17	SA14	DACK1*	SD14	MASTER*
18	SA13	DRQ1	SD15	0 V
19	SA12	REFRESH*	KEY	0 V
20	SA11	SYSCLK	-	-
21	SA10	IRQ7	-	-
22	SA9	IRQ6	-	-
23	SA8	IRQ5	-	-
24	SA7	IRQ4	-	-
25	SA6	IRQ3	-	-
26	SA5	DACK2*	-	-
27	SA4	TC	-	-
28	SA3	BALE	-	-
29	SA2	+5 V	-	-
30	SA1	OSC	-	-
31	SA0	0 V	-	-
32	0 V	0 V	-	-

* active low

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