

User Manual

PCM-3343

**DM&P Vortex86DX-1GHz SOC PC/104 SBC, LVDS ,TTL,
dual LAN, CFC,and On board memory**

Version March 2010

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 - 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 installation, please ensure the following items have been shipped: Item Part Number:

- 1 PCM-3343 SBC
- 1 Startup manual
- 1 Utility CD
- Cables

Part Number	Description
1700060202	1 x CABLE 6P-6P-6P PS/2 KB & MOUSE 20cm
1703060053	1 x PS2 Cable 6P (MINI-DIN)-6P (Wafer 2.0 mm) 6 cm
1703100260	1 x USB cable 2port 2.0mm pitch w/ bracket 26cm
1701200220	1 x RS232 x2 ports 2.0mm pitch 22CM
1703040157	1 x RS-422/485 W/D-SUB COM 4P 15 cm
1700000898	1 x VGA cable D-SUB 15P(F)/12P-1.25MM 15CM
1700017863	1 x LAN cable RJ45/2*5P-2.0 15cm
9660104000	1 x PC/104 screw and copper post package

Optional Accessories

Model Number	Description
1701440350	1 IDE cable 44P/44P/44P 35 cm

Ordering Information

Model Number Description

PCM-3343F-256A1E PC104 DM&P Vortex86DX-1GHz, 265 MB Memory On board , VGA, LVDS,TTL,2 LAN,4COM,4USB,PC/104

PCM-3343L-256A1E PC104 DM&P Vortex86DX-1GHz, 265 MB Memory On board, 1 LAN,2COM,2USB,PC/104

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Chapter 1

General Introduction

This chapter gives background information on the PCM-3343.

Sections include:

- Introduction
- Specifications

1.1 Introduction

The PCM-3343 is a fanless, cost-effective, small size (96 x 90mm) PC/104 SBC (Single Board Computer) geared to satisfy the needs for various industrial computing equipment. PCM-3343 is ideal for data-acquisition, environment monitoring systems, Intelligent Vehicle management, factory automation, and medical applications that require basic X86 computing power for various low-power, and cost-effective embedded applications.

PCM-3343 is designed with DM&P Vortex86DX System-On-Chip. The Vortex86DX is a high performance and fully static 32-bit X86 processor with the compatibility of 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).

PCM-3343 offers convenient connector layout, easy assembly with right angle connectors, and multiple I/O including dual 10/100Mbps Ethernet, four USB (Universal Serial Bus) 2.0, VGA port, 24-bit LVDS and TTL outputs, four RS-232 serial ports (one of them can be configured to RS-422/485 serial port,) I2C connector, 16-bit GPIO, and one PC/104 expansion slot. PCM-3343 supports DDR2 333 SRAM 256MB on board to endure high vibration environments.

1.2 Features

- Ultra low power, fanless DM&P Vortex86DX- 1 GHz
- Integrated Floating-point Unit
- Supports 256MB on-board DDR2 SDRAM memory
- Supports CRT+LCD dual independent display
- Supports 24-bit LVDS/TTL
- Supports 2 LAN ports in standard PC/104 96x90mm dimension
- Supports Embedded Software API, Watchdog,GPIO,Brightness control, I2C,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 PC/104 SBC Functions

- **Processor:** DM&P Vortex86DX SOC 1GHz
 - **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**
 - **Package Type**
27x27, 581 Ball BGA

Note! For wide temperature version, CPU speed would be downgraded.



- **System Memory:** Supports On board DDR2 333 SDRAM Memory 256 MB. Maximum up to 512 MB for optional
- **2nd Cache Memory:** 256 KB on the processor
- **BIOS:** Award integrated 16 Mbit ROM in SOC
- **Watchdog timer:** System reset; Software programmable from 30.5 μ sec.to 512 sec. x 2 sets
- **Expansion Interface:** PC/104 (ISA)
- **Battery:** Lithium 3V/210 mAh
- **Enhanced IDE interface:** One channel supports up to two EIDE devices . Supports UDMA 33 mode

Note! When you use the CF socket , the IDE connector can only be attached to one IDE device.



- **CFC:** Solid State Disk (SSD) supports one 50-pin socket for CFC type I (type II optional) shared with primary IDE
- **External SPI onboard Flash:** Optional onboard 4MByte SPI Flash Disk (Support by request for boot device or storage on DOS OS)
- **Serial ports:** Four serial RS-232 ports, one of them can be configured to RS-422/485 ports by jumper J2
 1. CN7 provides two RS-232 serial ports (COM3/4).
 2. CN12 provides two RS-232 serial ports (COM1/2).
 3. CN6 provides one RS-422/485 serial port adjusted by J2, and you just can select either COM2 (RS-232) on CN12 or RS-422/485 on CN6.

Note! 1. When RS-422/485 on CN6 is enable, COM2(RS-232) on CN12 will be disable.



2. When using PWM Brightness control, COM2 will be configured as PWM function using. You can select either COM2 or PWM Brightness control function.

- **Keyboard/mouse connector:** Supports one standard PC/AT keyboard and a PS/2 mouse
- **USB:** Four USB 2.0 ports compliant universal serial bus ports
- **GPIO:** 16 bit general purpose Input/Output
- **I2C:** Compliant w/t V2.1, Some master code (general call, START and CBUS) not support

1.3.2 VGA/LVDS Interface

- **Controller:** SMI SM712 2D graphic Chip
- **VRAM:** 4 MB internal memory
- **Graphic Engine:**
 - 62.5MHz single clock/cycle engine (EM+)
 - 86MHz single clock/cycle engine (EM4+)
 - Designed to accelerate DirectDraw
- **Output Interfaces:**
 - VGA: Supports up to 1024 x 768 @85Hz
 - LVDS: Supports up to 1024 x 768 @ 24-bit LVDS LCD Panel
 - TTL: Supports up to 1024 x 768 @ 24-bit TTL LCD Panel
 - Dual Display: CRT + LVDS and CRT+TTL, support extended mode and clone mode

Note! *TTL and LVDS interface are not recommended to use together at the same time.*



1.3.3 Ethernet Interface

- Supports Dual 10/100 Mbps Ethernet networking
- LAN1 Controller: Integrated Vortex86DX SOC 10/100 Mbps Ethernet
- LAN2 Controller: Realtek RTL 8100CL 10/100 Mbps Ethernet

1.3.4 OS and SW API support

This board supports Win XP, Window WP Embedded, Win CE and Linux.

Supports Embedded Software API: Watchdog, GPIO, Brightness control, I2C, and backlight on/off.

Supports Embedded Software Utility: BIOS flash, eSOS, Embedded Security ID, and Flash Lock.

Software Ordering Information:

2070009536: CE 6.0 Pro PCM-3343 V1.3 ENG

2070009528: XPE WES2009 Vortex86DX V4.0 ENG

2070009529: XPE WES2009 Vortex86DX V4.0 MUI24"

205E343000: SUSI 3.0 SW API for PCM-3343 Window XP/XPE

For further information about OS support in your PCM-3343, visit the following Advantech web resource: www.advantech.com or please contact your technical support center.

1.3.5 Mechanical and Environmental

- **Dimensions:** 96 x 90 mm (3.8" x 3.5") Mechanical Drawing (dxf file) is available.
- **Power Supply Type:** AT
- **Power Requirement:** +5 V \pm 5%, +12 V \pm 5% (Optional), (5 V only, 12 V optional for PC104 add on card and LCD inverter)
- **Power Consumption:** (Vortex86DX 1GHz, 256 MB DDRII 667)
 - **Power on Load:** +5 V @ 0.63 A, +12 V @ 0.01 A
 - **Max load:** +5 V @ 0.85 A, +12 V @ 0.01 A
 - **Idle mode:** +5 V @ 0.55 A, +12 V @ 0.01 A
- **Power Consumption Conditions:**
 - **Test software:** Passmark Burnin Test Pro6.0
 - **Power on - Boot:** Measure the maximum current value of between system power on and boot-up to O.S.
 - **Max. load:** Measure the maximum current value which system under maximum load on running Passmark Burnin Test (CPU: Top speed, RAM & Graphic: Full loading)
 - **Idle mode:** Measure the current value when system in DOS mode and without running any program
- **Operating temperature:** 0 ~ 60° C (32 ~ 140° F) (operation humidity: 40° C @ 85% RH Non-Condensing)
- **Weight:** 0.097 kg (0.214lb) (reference weight of total package)

1.4 Board layout: Dimensions

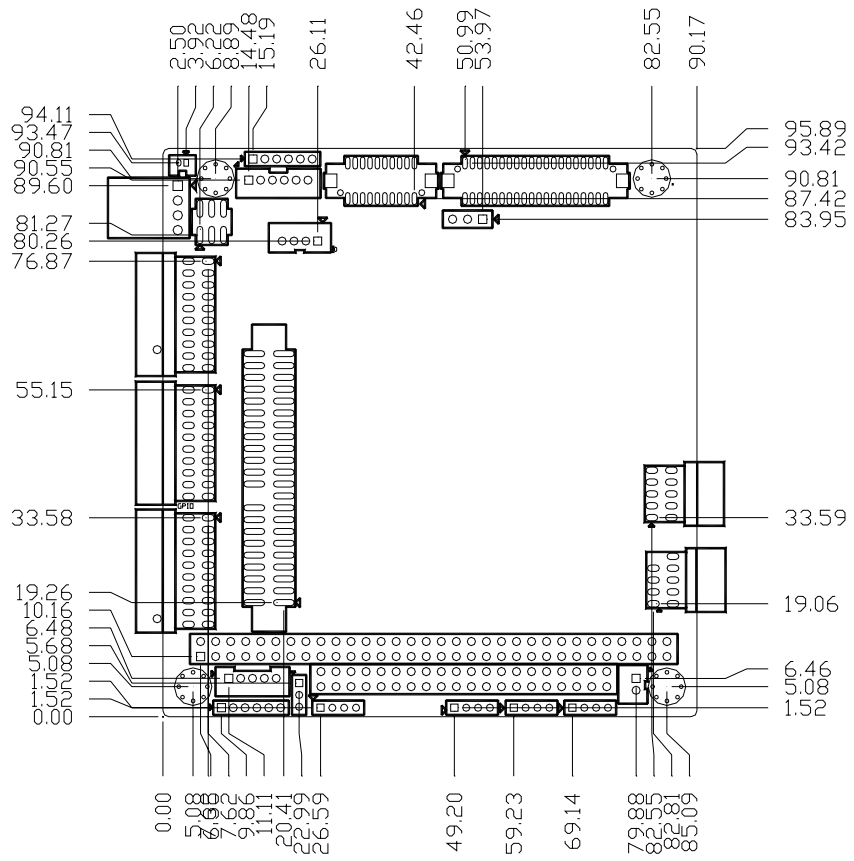


Figure 1.1 PCM-3343 Dimension (Top)

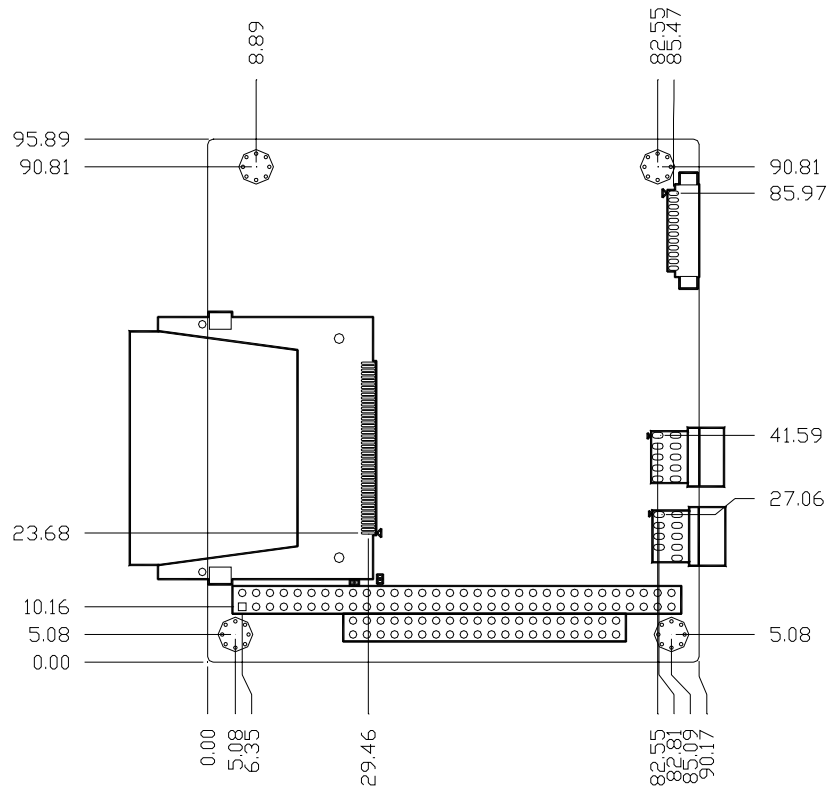


Figure 1.2 PCM-3343 Dimension (Bottom)

Chapter 2

H/W Installation

This chapter explains the setup procedures of the PCM-3343 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 Jumpers

The PCM-3343 has a number of jumpers that allow you to configure your system to suit your application. The table below lists the functions of the various jumpers.

Table 2.1: Jumpers

Label	Function
J1	LVDS Panel Power Select
J2	COM2 RS-232/RS422/RS485 Select

2.2 Connectors

Onboard connectors link the PCM-3343 to external devices such as hard disk drives, a keyboard, USB, or COM. The table below lists the function of each of the board's connectors.

Table 2.2: Connectors

Label	Function
CN1	SPI Connector
CN2	LVDS Panel Connector
CN3	LCD Panel Connector
CN4	PS2 Keyboard/Mouse Connector
CN5	Power In Connector
CN6	RS422/RS485 Connector
CN7	COM3/4 Connector
CN8	PC104 Connector
CN9	GPIO Connector
CN10	IDE Connector
CN11	LAN2 Connector
CN12	COM1/2 Connector
CN13	USB1/2 Connector
CN14	Inverter Connector
CN15	System Reset Connector
CN16	-12V / -5V Power In Connector
CN17	JTAG Connector
CN18	PWR / HDD LED Connector
CN19	LAN1 LED Connector
CN20	I2C Connector
CN21	LAN2 LED Connector
CN22	VGA Connector
CN23	CF Socket
CN24	LAN1 Connector
CN25	USB3/4 Connector

2.3 Locating Connectors & Block Diagram

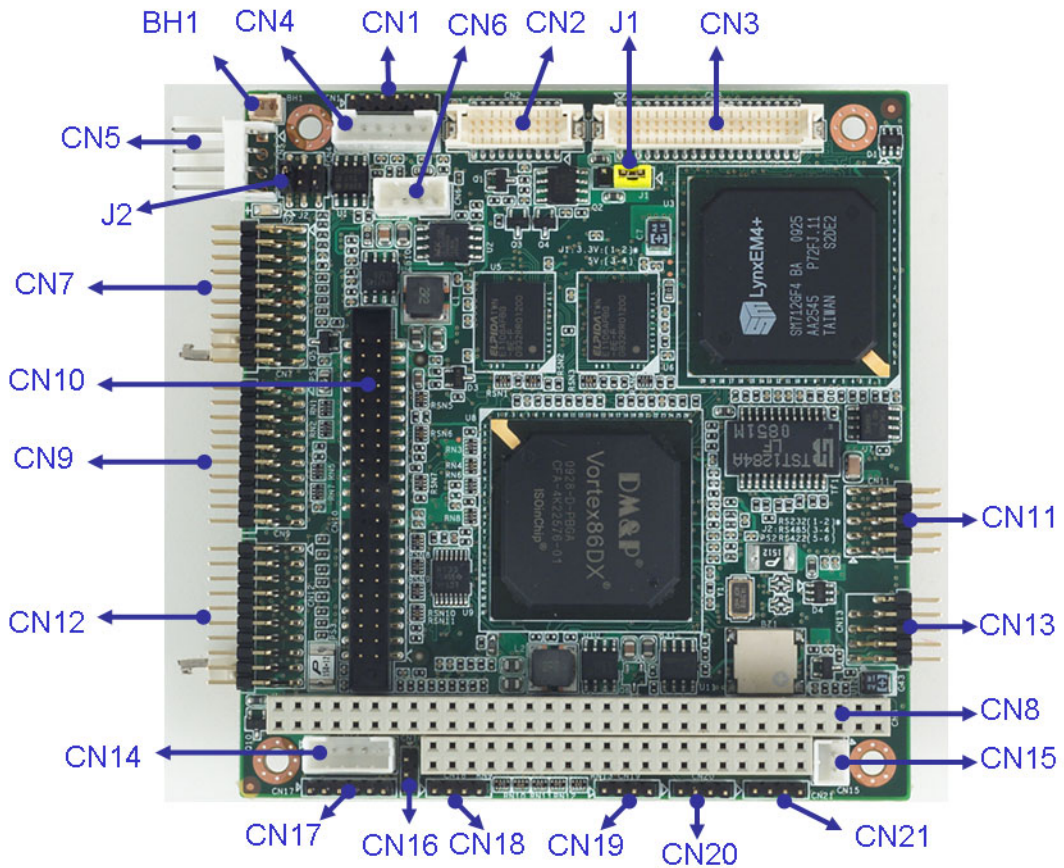


Figure 2.1 Connectors (Component Side)

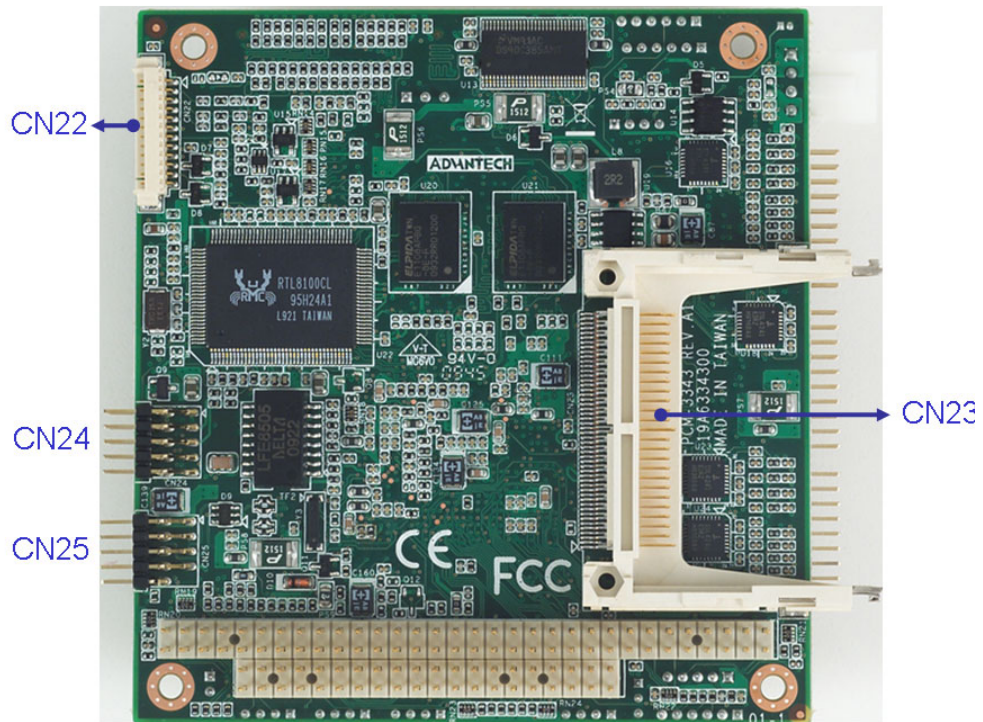


Figure 2.2 Connectors (Solder Side)

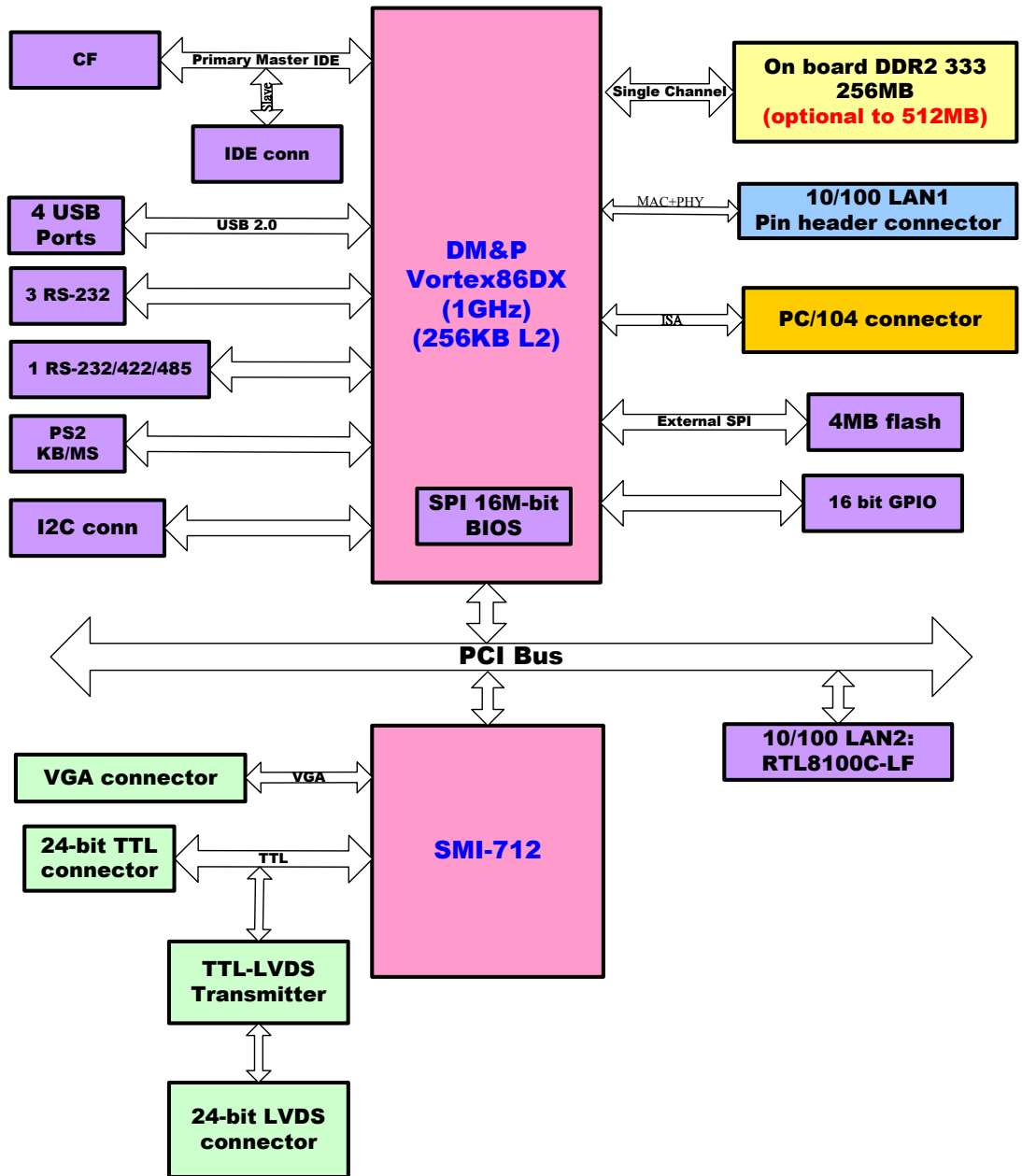
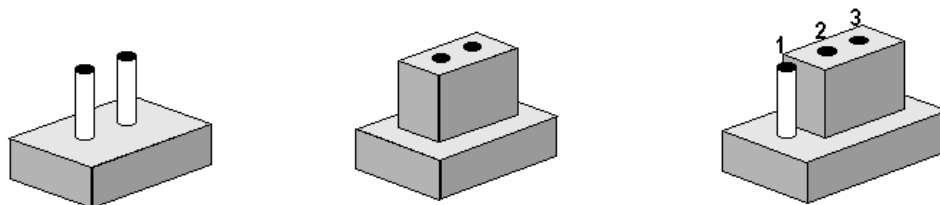


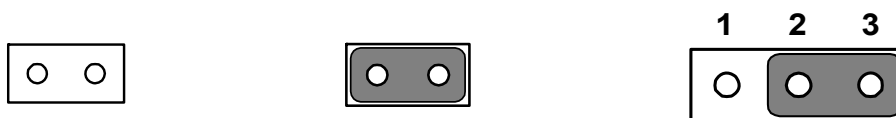
Figure 2.3 Block Diagram

2.3.1 Jumper Description

You may configure your card to match the needs of your application by setting jumpers. A jumper is a metal bridge used to close an electric 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” 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.



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



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.

2.4 Setting Jumper

2.4.1 LVDS Panel Power Select (J1)



Table 2.3: LVDS Panel Power Select (J1)

Setting	Function
1-2	3.3V (default)
2-3	5V

2.4.2 COM2 RS232/RS422/RS485 Select (J2)

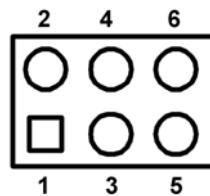


Table 2.4: COM2 RS232/RS422/RS485 Select (J2)

Setting	Function
1-2	RS-232 (Default)
3-4	RS-485
5-6	RS-422

2.5 External SPI Flash

The board provides optional onboard external SPI flash up to 4MB for bootable devices using DOS Operating System. If required, please contact with Advantech's sales rep to support onboard external SPI flash by request, and follows below steps to enable external SPI flash.

1. If you want to use the external SPI flash as storage for read/ write in DOS OS, please adjust the BIOS SETUP \Advanced Chipset Features\Virtual Disk to "Enabled". and then use "SPITool.exe" on the Drive CD to format it, so that you can read/write external SPI flash.
2. If you want to utilize the external SPI flash as a bootable device in DOS OS, please make a DOS bootable disk on a CF card or IDE hard drive, boot from the DOS bootable disk and then perform format A: /s pointing towards the external flash. Next, set the BIOS SETUP\ Boot Device to "FLOPPY", so that you can boot from the external SPI DOS OS.

2.6 SPI Connector (CN1)

The board provides 6-pin external SPI connector for external SPI device and peripheral usage.

CN1	SPI Connector		
Part Number	1653006101		
Footprint	PH_6x1V_2.00mm		
Description	PIN HEADER 6*1P 180D(M) 2.0mm DIP W/O Pb		
Pin	Pin Name	Signal Type	Signal Level
1	+V3.3_SPI	PWR	
2	GND	GND	
3	SPI_CLK	Out	+3.3 V
4	SPI_DO	Out	+3.3 V
5	SPI_DI	IN	+3.3 V
6	SPI_CS#	Out	+3.3 V

2.7 VGA/LVDS/TTL interface connections

The PCM-3343's VGA interface can drive conventional CRT displays and is capable of driving LVDS and TTL flat panel displays. The board has three connectors to support these displays: one for standard CRT VGA monitors, one for LVDS type LCD panels, another one for LVDS type LCD panels.

PCM-3343 uses SMI SM712 2D graphic Chip offering enhanced capabilities for dual view and for handling dual applications, CRT+TTL, and CRT +LVDS. Each display can support independent full screen full motion video, as well as independent graphics refresh rates, resolutions, and color depths.

LVDS and TTL can support resolutions of 640 x 480, 800 x 480, 800 x 600, and 1024 x 768.

- Note!**
1. *TTL and LVDS interfaces are not recommended to be used together at the same time.*
 2. *In DOS mode, PCM-3343 can't display full screen on 1024 x 768 resolutions.*



2.7.1 CRT display connector (CN22)

CN22 is a 12-pin, dual-inline header used for conventional CRT displays. A simple one-to-one adapter can be used to match CN22 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 CN22 are detailed in Appendix A.

2.7.2 TTL connector (CN3)

The PCM-3343 uses SMI SM712 2D graphic Chip that supports single channel 24-bit TTL panel up to 1024X768 panel resolution.

2.7.3 LVDS connector (CN2)

Four PCM-3343 series, the board supports 1 channel 24-bit LVDS LCD panel displays up to 1024X768 panel resolution.

2.7.4 Panel Inverter Power (CN14)

The LCD inverter is connected to CN14 via a 5-pin connector to provide +5 V/+12 V power to the LCD display. J1 provides inverter voltage selection function, closing Pin 1, 2 is for 3.3V power input inverter; closing Pin 2, 3 is for 5V power input inverter.

2.8 Keyboard and PS/2 mouse connector (CN4)

The board provides a keyboard connector that supports both a keyboard and a PS/2 style mouse. In most cases, especially in embedded applications, a keyboard is not used. If the keyboard is not present, the standard PC/AT BIOS will report an error or fail during power-on self-test (POST) after a reset. The PCM 3343's BIOS standard setup menu allows you to select "All, But Keyboard" under the "Halt On" selection. This allows no-keyboard operation in embedded system applications, without the system halting under POST.

2.9 Power Connectors (CN5)

Supplies main power +5 V to the PCM-3343, and to devices that require +12 V.

2.10 COM port connector (CN7 & CN12 & CN6)

The board provides four RS-232 serial ports, and CN6 can be configured to RS-422/485

1. CN7 provides two RS-232 serial ports (COM3/4).
2. CN12 provides two RS-232 serial ports (COM1/2).
3. CN6 provides one RS-422/485 serial port adjusted by J2, and you just can select either COM2 (RS-232) on CN12 or RS-422/485 on CN6.

Note!



1. When RS-422/485 on CN6 is enabled, COM2(RS-232) on CN12 will be disabled.
2. When using PWM Brightness control, COM2 will be configured for PWM function use. You can select either COM2 or PWM Brightness control function.

Four serial RS-232 ports in two 20 pin connector (CN7&CN12), and one serial port RS422/485 in 4 pin connector (CN6).

They provide connections for serial devices or a communication network. You can find the pin assignments for the COM port connector in Appendix.

2.10.1 Serial Port RS-422/485 (CN6)

CN6 can be configured to operate in RS-422 or RS-485 mode by J2.

2.11 GPIO Connector (CN9)

The board supports 16-bit GPIO through GPIO connector. The 16 digital inputs and outputs can be programmed to read or control devices, with each input or output defined. Refer to Appendix for detailed information on the pin assignments and programming guide.

Note! *The Input power from external device cannot exceed 3.3 V.*



2.12 IDE Connector (CN10)

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 33.

Note! *When you using CF socket , the IDE connector only be attached to one IDE device.*



2.12.1 Connecting hard drives

Connecting drives is done in a daisy-chain fashion. If you want to use IDE Hard Drives, please purchase an additional 44 PIN IDE cable (Advantech's p/n: 1701440350) that can connect to 1.8" and 2.5" drives.

1. Connect one end of the cable to the 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.

2.13 LAN Connector (CN24 & CN11)

Ethernet configuration

The board is equipped with two high performance 32-bit PCI-bus Ethernet interface which are fully compliant with IEEE 802.3 10/100Mbps, and supported by all major network operating systems.

2.13.1 LAN1 Connector (CN24)

DM&P Vortecx86DX is integrated with a Fast Ethernet MAC and Physical chip to provide the Fast Ethernet Control unit that has 32-bit performance, PCI bus master capability, and full compliance with IEEE 802.3u 100Base-T specifications and IEEE 802.3x Full Duplex Flow Control. LAN1 connection utilizes the Vortecx86DX Integrated Fast Ethernet Control unit on CN24 through an internal 10-pin right angle pin header.

2.13.2 LAN2 Connector (CN11)

PCM-3343 LAN2 connection uses the Realtek RTL8100C 10/100Mbps LAN chip via PCI bus through an internal 10-pin right angle pin header.

2.13.3 LAN LED Connector (CN19 & CN21)

PCM-3343 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 performing or not. Refer to appendix for detailed information on the pin assignments. LAN1 LED connector is CN19, and LAN2 LED connector is CN21.

2.14 USB connectors (CN13 & CN25)

The board provides up to four USB (Universal Serial Bus) ports using Plug and Play. The USB interface comply with High Speed USB specification Rev. 2.0 which supports 480 Mbps transfer rate, and are fuse protected.

The USB interfaces are 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.

2.15 System Reset Connector (CN15)

If you install a reset switch, it should be an open single pole switch. Momentarily pressing the switch will activate a reset.

2.16 -12V/-5V Power In Connector (CN16)

The PCM-3343 is equipped with a Negative Power Input connector providing -12 V & -5 V power if your applications happen to need it. -12V and -5V connector is designed for PC/104 add-on card.

2.17 JTAG Connector (CN17)

PCM-3343 provides one 6-pin JTAG connector for initial BIOS flash use through specific BIOS flash tool. It's only reserved for debugging.

CN17	JTAG Connector		
Part Number	1653006101		
Footprint	PH_6x1V_2.00mm		
Description	PIN HEADER 6*1P 180D(M) 2.0mm DIP W/O Pb		
Pin	Pin Name	Signal Type	Signal Level
1	+5V	PWR	
2	GND	GND	
3	TCK	In	+3.3V
4	TDO	Out	+3.3V
5	TDI	In	+3.3V
6	TMS	In	+3.3V

2.18 PWR / HDD LED Connector (CN18)

POWER LED (Pin1 & Pin2)

POWER LED indicator lights up when the power is on.

HDD LED (Pin3 & Pin4)

The HDD LED indicator for hard disk access is an active low signal.

2.19 I2C Bus connector (CN20)

PCM-3343 provides I2C Bus connection to I2C protocol embedded devices. Advantech also provides I2C API allowing a developer to interface with an embedded system environment and transfer serial messages using the I2C protocols, allowing multiple simultaneous device control. Note that I2C clock and data signals are 3.3 V voltage level.

2.20 CompactFlash (CN23)

The board provides a CompactFlash card type I socket and type II for optional kit. The CompactFlash card can be enabled/disabled via the BIOS settings. The default setting is Master.

2.21 Watchdog timer configuration

An onboard watchdog timer reduces the chance of disruptions which EMP (electromagnetic pulse) interference can cause. This is an invaluable protective device for standalone or unmanned applications.

2.22 PC/104 Connector (CN8)

PCM-3343 supports full ISA compatible functions via PC/104 connector (CN8).

20 x 2 (F) 2.54 mm 51.86 mm x 5.01 mm x 11.45 mm p = 3.40 mm

32 x 2 (F) 2.54 mm 82.34 mm x 5.01 mm x 11.45 mm p = 3.40 mm

PC/104 negative voltage: One 3 * 1P pin header (CN16) supports -5 V/-12 V power input for ISA devices.

Chapter 3

BIOS Operation

Sections include:

- BIOS Introduction
- BIOS Setup

3.1 BIOS Introduction

AwardBIOS 6.0 is a full-featured BIOS provided by Advantech to deliver superior performance, compatibility, and functionality to industrial PCs and embedded boards. Its 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, AMD Geode, K7 and K8 (including multiple processor platforms), and VIA Eden C3 and C7 CPUs.

You can use Advantech's utilities to select and install features that suit your needs and your customers' needs.

3.2 BIOS Setup

The PCM-3433 series has AwardBIOS 6.0 built-in, which includes a CMOS SETUP utility that allows users to configure settings as required or to activate certain system features.

The CMOS SETUP saves configuration settings in the CMOS RAM of the motherboard. When the system power is turned off, the onboard battery supplies the necessary power to the CMOS RAM so that settings are retained.

To access the CMOS SETUP screen, press the button during the power-on BIOS POST (Power-On Self Test).

CONTROL KEYS

< ↑ >< ↓ >< ← >< → > Move to select item

<Enter> Select Item

<Esc> Main Menu - Quit and not save 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

<F6> Save all CMOS changes to BIOS

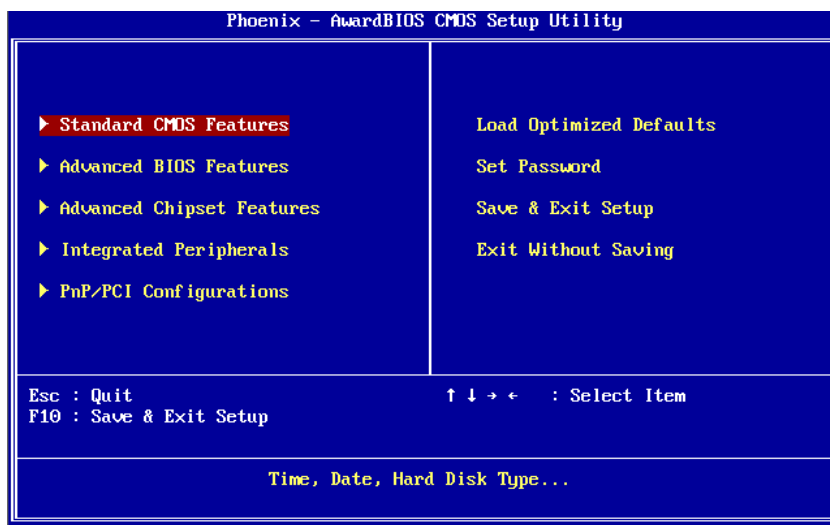
<F7> Load Optimized Default

<F9> Menu in BIOS

<F10> Save all CMOS changes

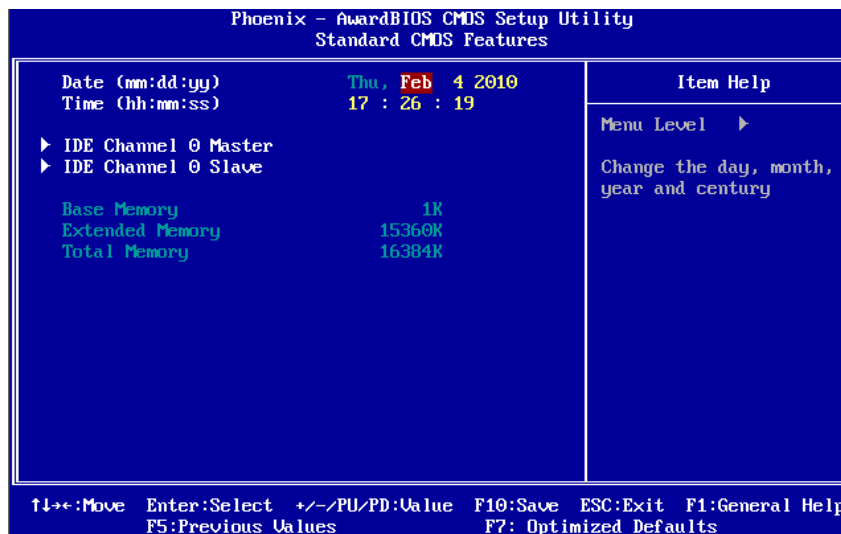
3.2.1 Main Menu

Press the key during startup to enter the BIOS CMOS Setup Utility; the Main Menu will appear on the screen. Use arrow keys to highlight the desired item, and press <Enter> to accept, or enter the sub-menu.



- **Standard CMOS Features**
This setup page includes all the features for standard CMOS configuration.
- **Advanced BIOS Features**
This setup page includes all the features for advanced BIOS configuration.
- **Advanced Chipset Features**
This setup page includes all the features for advanced chipset configuration.
- **Integrated Peripherals**
This setup page includes all onboard peripheral devices.
- **PnP/PCI Configurations**
This setup page includes PnP OS and PCI device configuration.
- **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 <week>, <month>, <day>, <year>.

Week	From Sun to Sat, determined and display by BIOS only
Month	From Jan to Dec
Day	From 1 to 31
Year	From 1999 through 2098
- **Time**

The time format is <hours> : <minutes> : <seconds>, based on 24-hour time.
- **IDE Channel 0 Master/Slave**

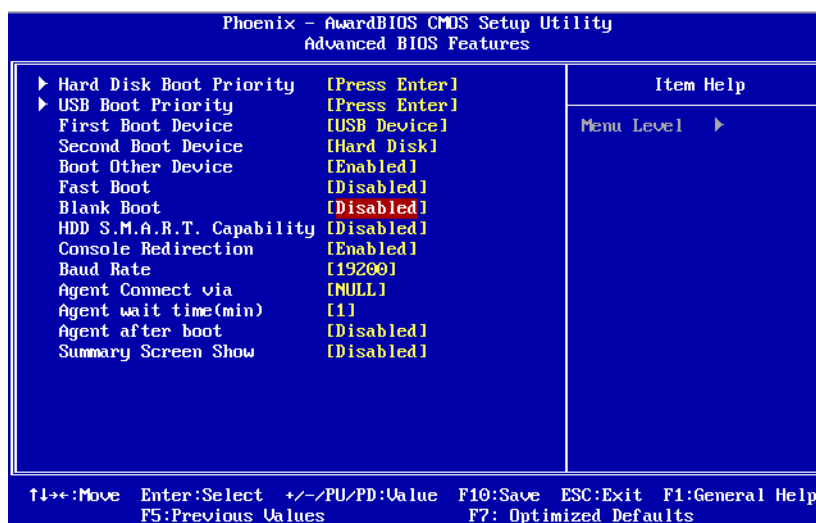
IDE HDD Auto-Detection Press "Enter" for automatic device detection.
- **Base Memory**

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 Features

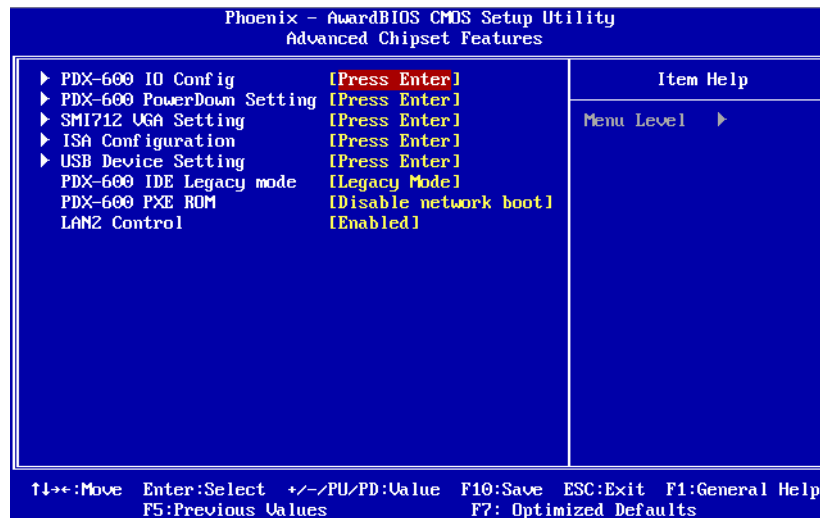


- **Hard Disk Boot Priority [Press Enter]**
 This item allows a user to select the boot sequence for system devices such as HDD, SCSI, and RAID.
- **USB Boot Priority [Press Enter]**
 This item allows a user to choose the bootable USB device.
- **First / Second / Boot Other Device**

Floppy	Sets boot priority for the Floppy.
Hard Disk	Sets boot device priority for the Hard Disk.
CDROM	Sets boot device priority for the CDROM.
USB-Device	Sets boot device priority for the USB-Device.
USB-FDD	Sets boot device priority for the USB-FDD.
USB-ZIP	Sets boot device priority for the USB-ZIP.
USB-CDROM	Sets boot device priority for the USB-CDROM.
LAN	Sets boot device priority for the LAN.
Disabled	Disable this boot function.
- **Fast Boot [Disabled]**
 This item enable/disable Fast Boot feature.
- **Blank Boot**
 - HDD S.M.A.R.T Capability [Disabled]
 This item enable/disable HDD Self Monitoring Analysis Reporting Technology feature.
- **Console Redirection [Disabled]**
 This item allows a user to enable / disable console redirection mode.
- **Baud Rate [19200]**
 This item allows a user to set baud rate modes.
- **Agent Connect via [NULL]**
 This item allows a user to set agent connect modes.
- **Agent wait time(min) [1]**
 This item allows a user to set agent wait time (min).
- **Agent after boot [Disabled]**
 This item allows a user to set agent running after boot mode.

- **Summary Screen Show [Disabled]**
Show all Motherboard information on POST.

3.2.4 Advanced Chipset Features



Note! *The "Advanced Chipset Features" screen controls the configuration of the board's chipset register settings and performance tuning - the options on this screen may vary depending on the chipset type. It is strongly recommended that only technical users make changes to the default settings.*



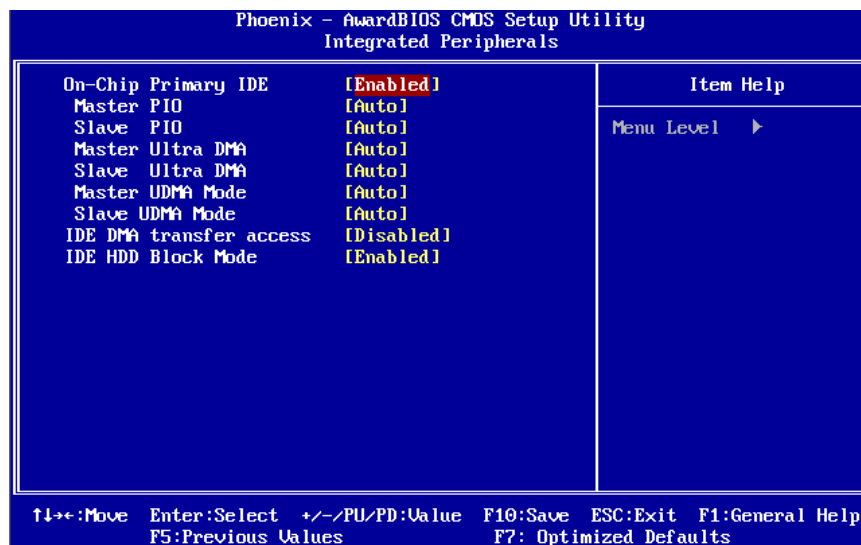
- **PDX-600 IO Config [Press Enter]**
This item allows a user to set Vortex86DX SOC UART resources.
- **PDX-600 PowerDown Setting [Press Enter]**
This item allows a user to set LAN1 powerdown function.
- **SMI712 VGA Setting [Press Enter]**
This item allows a user to set VGA related features.
- **ISA 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 Window XP or Window XP embedded.*



- **PDX-600 PXE ROM [Disabled network boot]**
This item allows a user to enable LAN1 PXE boot function.
- **LAN2 Control [Enabled]**
This item is enables or disables the onboard LAN2 controller.

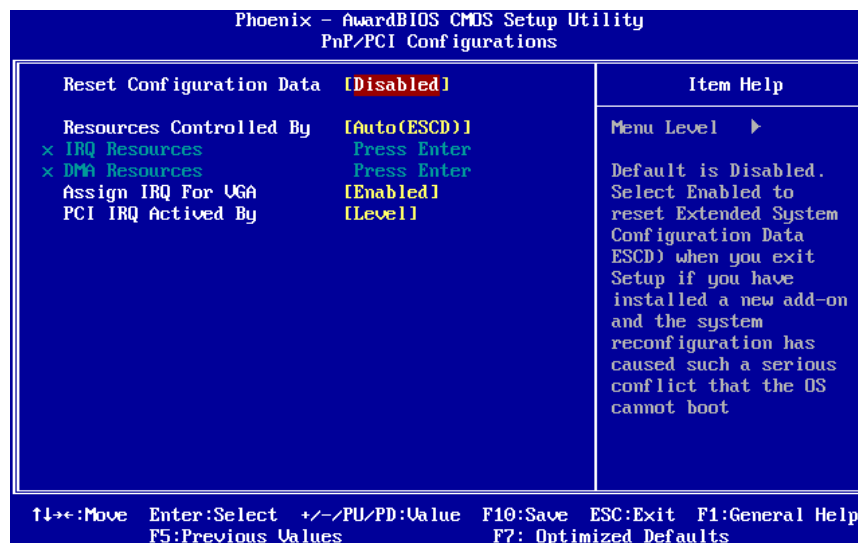
3.2.5 Integrated Peripherals



Note!  The "Integrated Peripherals" screen controls chipset configuration for IDE, ATA, SATA, USB, AC97, MC97 and Super IO and Sensor devices. The options on this screen vary depending on the chipset.

- **On-Chip Primary IDE [Enabled]**
This item enables chipset IDE device 1 controller.
- **Master PIO [Auto]**
This item allows a user to adjust master IDE mode type. BIOS default value is "Auto".
- **Slave PIO [Auto]**
This item allows a user to adjust slave IDE mode type. BIOS default value is "Auto".
- **Master Ultra DMA [Auto]**
This item allows a user to adjust primary master IDE mode type. BIOS default value is "Auto".
- **Slave Ultra DMA [Auto]**
This item allows a user to adjust primary slave IDE mode type. BIOS default value is "Auto".
- **Master UDMA Mode [Auto]**
This item allows a user to adjust primary master IDE mode type. The BIOS default value is set to "Auto".
- **Slave UDMA Mode [Auto]**
This item allows a user to adjust primary slave IDE mode. The BIOS default value is set to "Auto".
- **IDE DMA transfer access [Disabled]**
This item allows a user to adjust IDE DMA mode. This will increase IDE data transfer speed. BIOS default value is set to "Enabled".
- **IDE HDD Block Mod [Enabled]**
This item allows a user to enable or disable the IDE block data transfer mode. This will speed up HDD data transfer efficiency. BIOS default value is set to "Enabled".

3.2.6 PnP/PCI Configurations

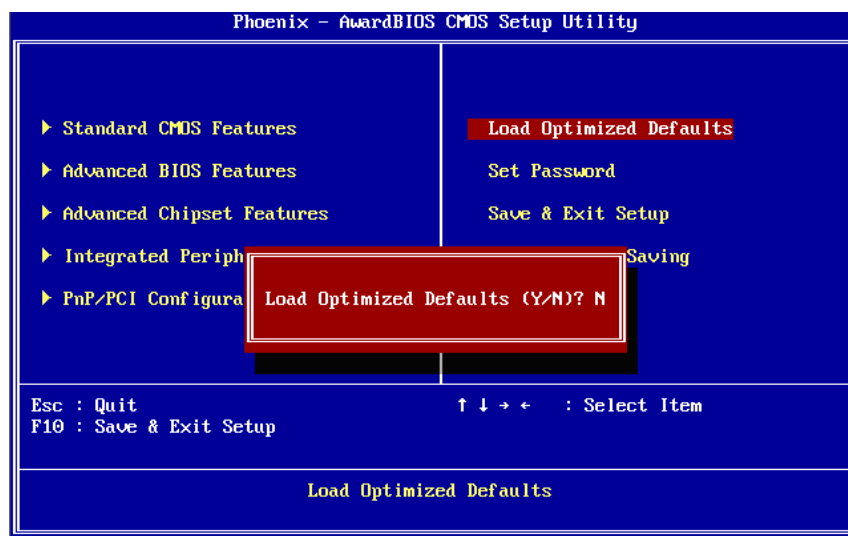


Note! The "PnP/PCI Configurations" screen sets up the IRQ and DMA (both PnP and PCI bus assignments).



- **Reset Configuration Data [Disabled]**
This item allow a 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 Activated By [Level]**
The item allows users to choose level or edge.

3.2.7 Load Optimized Defaults

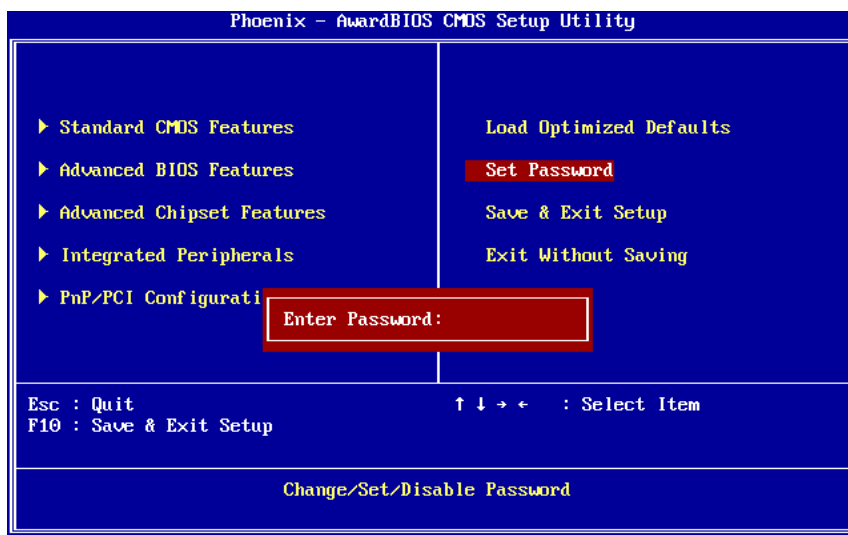


Note! *Load Optimized Defaults loads the default system values directly from ROM. If the stored record created by the Setup program should ever become corrupted (and therefore unusable).*



These defaults will load automatically when you turn the PCM-3343 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 System or Setup, depending on which aspects you want password protected. System requires a password both to boot the system and to enter Setup. 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, then press <Enter>.
4. Select **Save to CMOS** and exit, type <Y>, then <Enter>.

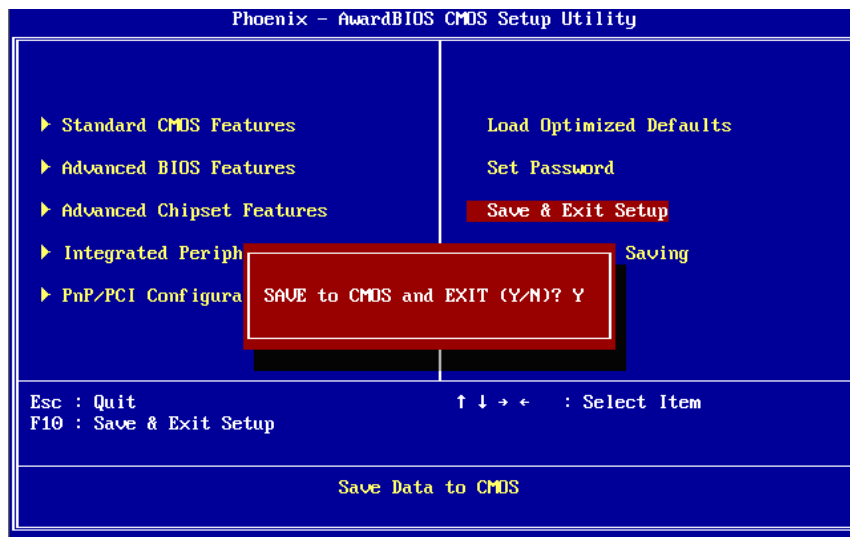
To Change Password

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 the **Confirm Password** prompt, type it in 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 a Password

1. 1. press <Enter>.
2. When you see the **Enter Password** prompt, enter the existing password and press <Enter>.
3. You will see **Confirm Password**, type it in again, and press <Enter>.
4. Select **Set Password** again, and at the **Enter Password** prompt, DO NOT enter anything - just press <Enter>.
5. At the **Confirm Password** prompt, again, DO NOT type in anything - just press <Enter>.
6. Select **Save to CMOS** and exit, type <Y>, then <Enter>.

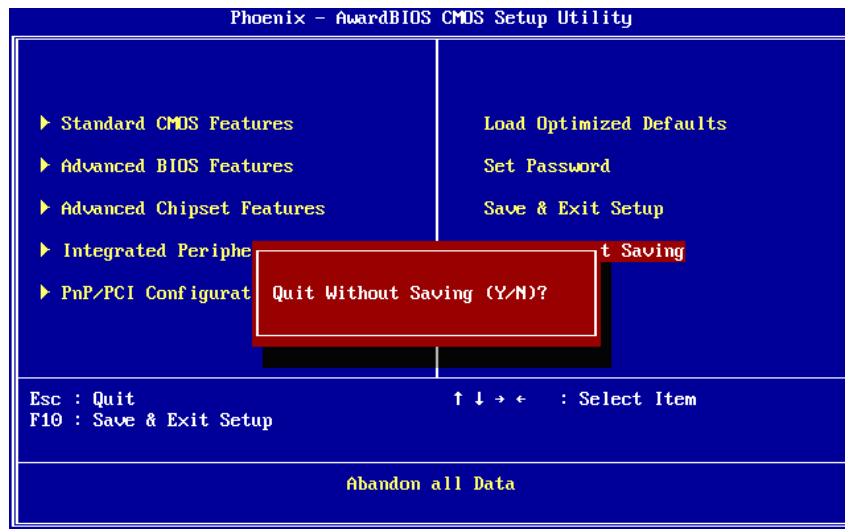
3.2.9 Save & Exit Setup



Note! Type "Y" will quit the BIOS Setup Utility and save user setup value to CMOS.
 Type "N" will return to BIOS Setup Utility.



3.2.10 Quit Without Saving



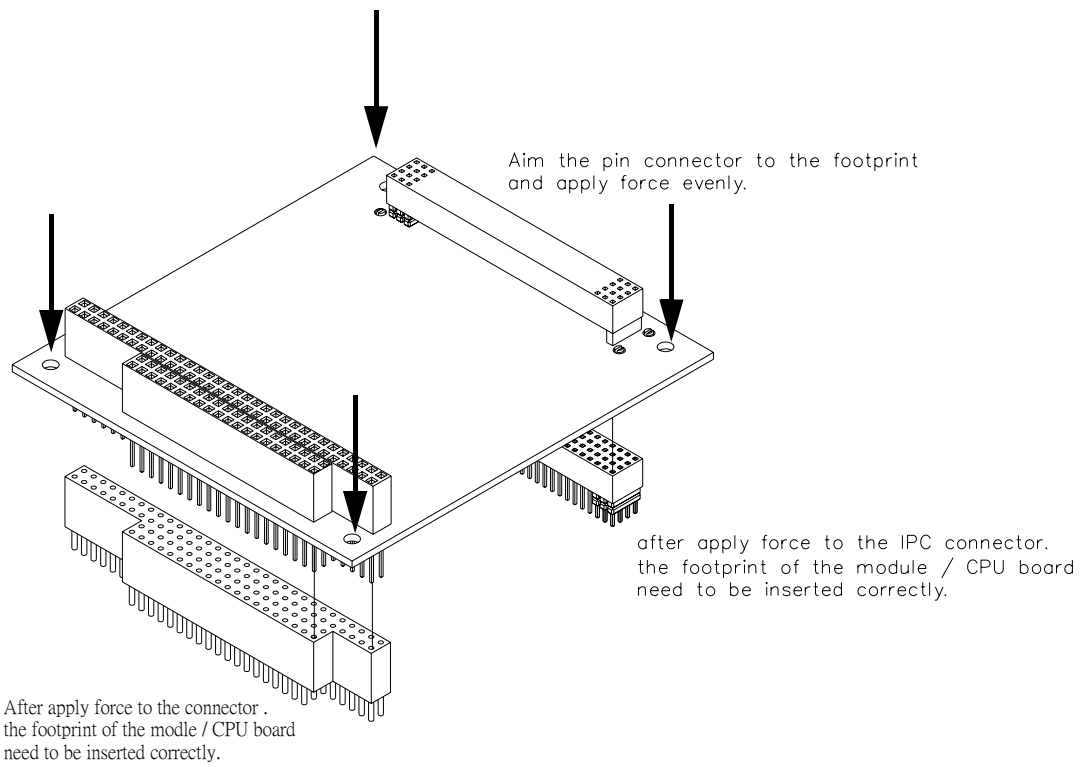
Note! Type "Y" will quit the BIOS Setup Utility without saving to CMOS.
 Type "N" will return to BIOS Setup Utility.



Chapter 4

Extension I/O
Installation

4.1 Extension I/O Installation



Chapter 5

Software Introduction
& Installation

5.1 S/W Introduction

The mission of Advantech Embedded Software Services is to "Enhance quality of life with Advantech platforms and Microsoft Windows® embedded technology." We enable Windows® Embedded software products on Advantech platforms to more effectively support the embedded computing community. Customers are freed from the hassle of dealing with multiple vendors (hardware suppliers, system integrators, embedded OS distributors) for projects. Our goal is to make Windows® Embedded software solutions easily and widely available to the embedded computing community.

5.2 Driver Installation

5.2.1 Windows XP Professional

To install the drivers for Windows XP Professional, insert the CD into the CD-Rom, it will auto-detect the hardware platform and then pop up with the "Embedded Computing Install Wizard" box; just select the drivers that you want to install then click "Install All Selected Drivers". Follow the Driver Setup Wizard instructions; click "Next" to complete the installation.

5.2.2 Other OS

To install the drivers for another Windows OS or Linux, please browse the CD to run the setup file under each chipset folder on the CD-ROM.

5.3 Value-Added Software Services

5.3.1 SUSI Introduction

To make hardware easier and convenient to access for programmers, Advantech has released a suite of API (Application Programming Interface) in the form of a program library. The program Library is called Secured and Unified Smart Interface or SUSI for short.

In modern operating systems, user space applications cannot access hardware directly. Drivers are required to access hardware. User space applications access hardware through drivers. Different operating systems usually define different interface for drivers. This means that user space applications call different functions for hardware access in different operating systems. To provide a uniform interface for accessing hardware, an abstraction layer is built on top of the drivers and SUSI is such an abstraction layer. SUSI provides a uniform API for application programmers to access the hardware functions in different Operating Systems and on different Advantech hardware platforms.

Application programmers can invoke the functions exported by SUSI instead of calling the drivers directly. The benefit of using SUSI is portability. The same set of API is defined for different Advantech hardware platforms. Also, the same set of API is implemented in different Operating Systems including Windows XP and Windows CE. This user's manual describes some sample programs and the API in SUSI. The hardware functions currently supported by SUSI can be grouped into a few categories including Watchdog, I2C, SMBus, GPIO, and VGA control. Each category of API in SUSI is briefly described below.

5.3.2 Software APIs

PCM-3343 supports software APIs including GPIO, I2C, backlight on/off, Brightness control, and Watchdog .

5.3.2.1 The GPIO API

General Purpose Input/Output is a flexible parallel interface that allows a variety of custom connections. It allows users to monitor the level of signal input or set the output status to switch on/off a device. Our API also provides Programmable GPIO, which allows developers to dynamically set the GPIO input or output status.

5.3.2.2 The I2C API

I2C is a bi-directional two-wire bus that was developed by Philips for use in their televisions in the 1980s and nowadays is used in various types of embedded systems. The strict timing requirements defined in the I2C protocol has been taken care of by SUSI. Instead of asking application programmers to figure out the strict timing requirements in the I2C protocol, the I2C API in SUSI can be used to control I2C devices by invoking other function calls. SUSI provides a consistent programming interface for different Advantech boards. That means user programs using SUSI are portable among different Advantech boards as long as the boards and SUSI provide the required functionalities. Overall product development times can be greatly reduced using SUSI.

5.3.2.3 The Display Control API

There are two kinds of VGA control APIs, backlight on/off control and brightness control. Backlight on/off control allows a developer to turn on or off the backlight, and to control brightness smoothly.

1. **Brightness Control**
The Brightness Control API allows a developer to interface with an embedded device to easily control brightness.
2. **Backlight Control**
The Backlight API allows a developer to control the backlight (screen) on/off in an embedded device.

5.3.2.4 The Watchdog API

A watchdog timer (abbreviated as WDT) is a hardware device which triggers an action, e.g. rebooting the system, if the system does not reset the timer within a specific period of time. The WDT API in SUSI provides developers with functions such as starting the timer, resetting the timer, and setting the timeout value if the hardware requires customized timeout values. For providing accurate, real-time and reliable data content; helping protect your system in a more reliable manner.

5.3.3 SUSI Utilities

PCM-3343 supports software Utility including Embedded Security ID, Flash lock, eSOS, and BIOS flash

5.3.3.1 Embedded Security ID

The embedded application is the most important property of a system integrator. It contains valuable intellectual property, design knowledge and innovation, but it is easily copied! The Embedded Security ID utility provides reliable security functions for customers to secure their application data within embedded BIOS.

5.3.3.2 Flash Lock

While using Advantech's SQFlash, customers can use the Flash Lock function and "Unlock" by BIOS while booting. Flash Lock feature helps users to lock the SQFlash to protect flash data from being read. The Flash Lock feature needs to be supported by Advantech BIOS

5.3.3.3 eSOS

The eSOS is a small OS stored in BIOS ROM. It will boot up in case of a main OS crash. It will diagnose the hardware status, and then send an e-mail to a designated administrator. The eSOS also provides remote connection: Telnet server and FTP server, allowing the administrator to rescue the system.

Note! *eSOS Utility support on PCM-3343 is required for BIOS modification. Please contact your Advantech's sales rep to discuss this function.*



5.3.4 SUSI Installation

SUSI supports many different operating systems. Each subsection below describes how to install SUSI and related software on a specific operating system. Please refer to the subsection matching your operating system.

5.3.4.1 Windows XP

In windows XP, you can install the library, drivers and demo programs onto the platform easily using the installation tool - SUSI Library Installer. After the installer has executed, the SUSI Library and related files for Windows XP can be found in the target installation directory. The files are listed in the following table.

Directory	Contents
\Library	<ul style="list-style-type: none"> ■ Susi.lib Library for developing the applications on Windows XP.
\Demo	<ul style="list-style-type: none"> ■ Susi.dll Dynamic library for SUSI on Windows XP. <ul style="list-style-type: none"> ■ SusiDemo.EXE Demo program on Windows XP. <ul style="list-style-type: none"> ■ Susi.dll Dynamic library for SUSI on Windows XP.
\Demo\SRC	Source code of the demo program on Windows XP.

The following section illustrates the installation process.

Note! *The version of the SUSI Library Installer shown on each screen shot below depends on your own particular version.*



1. Extract Susi.zip.
2. Double-click the "Setup.exe" file.

The installer searches for a previous installation of the SUSI Library. If it locates one, a screen shot opens asking whether you want to modify, repair or remove the software. If a previous version is located, please see the section of [Maintenance Setup]. If it is not located, the following screen shot opens. Click Next.

5.3.4.2 Windows CE

In windows CE, there are three ways to install the SUSI Library, you can install it manually or use Advantech CE-Builder to install the library or just copy the programs and the library onto a compact flash card.

Express Installation:

- You can use Advantech CE-Builder to load the library into the image.
- First, you click the My Component tab.
- In this tab, you click Add New Category button to add a new category, eg. the SUSI Library.
- Then you can add a new file in this category, and upload the SUSI.dll for this category.
- After these steps, you can select the SUSI Library category you created for every project.

Manual Installation:

You can add the SUSI Library into the image by editing any bib file. First you open project.bib in the platform builder.

- Add this line to the MODULES section of project.bib
Susi.dll \$(_FLATRELEASEDIR)\Susi.dll NK SH
- If you want to run the window-based demo, add following line: SusiTest.exe
\$(_FLATRELEASEDIR)\SusiTest.exe
- If you want to run the console-based demo, add following lines: Watchdog.exe
\$(_FLATRELEASEDIR)\Watchdog.exe NK S GPIO.exe
\$(_FLATRELEASEDIR)\GPIO.exe NK S
SMBUS.exe \$(_FLATRELEASEDIR)\SMBUS.exe NK S
- Place the three files into any files directory.
- Build your new Windows CE operating system.

5.3.5 SUSI Sample Programs

Sample Programs

The sample programs demonstrate how to incorporate SUSI into your program. There are sample programs for two categories of operating system, i.e. Windows XP and Windows CE. The sample programs run in graphics mode in Windows XP and Windows CE. The sample programs are described in the subsections below.

Windows Graphics Mode

There are sample programs of Windows in graphics mode for two categories of operating system, i.e. Windows CE and Windows XP. Each demo application contains an executable file SusiDemo.exe, a shared library Susi.dll and source code within the release package. The files of Windows CE and Windows XP are not compatible with each other.

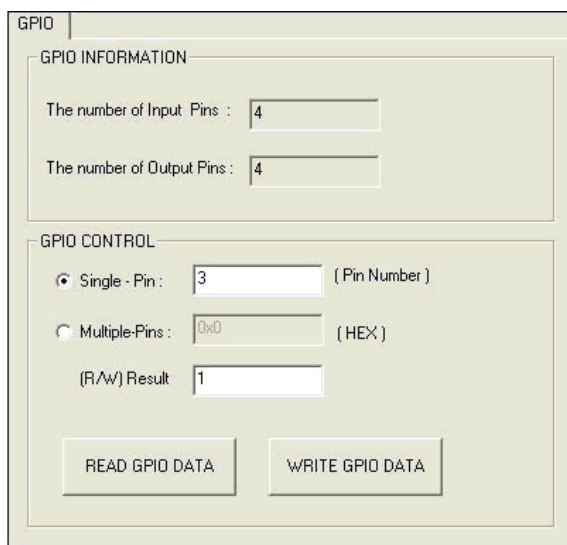
SusiDemo.exe is an executable file and it requires the shared library, Susi.dll, to demonstrate the SUSI functions. The source code of SusiDemo.exe also has two versions, i.e. Windows CE and Windows XP, and must be compiled under Microsoft Visual C++ 6.0 on Windows XP or under Microsoft Embedded Visual C++ 4.0 on Windows CE. Developers must add the header file Susi.h and library Susi.lib to their own projects when they want to develop something with SUSI.

SusiDemo.exe

The SusiDemo.exe test application is an application which uses all functions of the SUSI Library. It has five major function blocks: Watchdog, GPIO, SMBus, I2C and VGA control. The following screen shot appears when you execute Susi-Demo.exe. You can click function tabs to select test functions respectively. Some function tabs will not show on the test application if your platform does not support such functions.

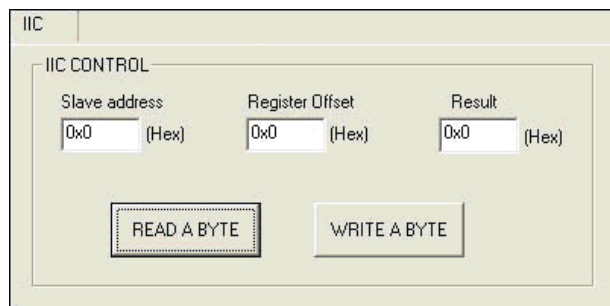


GPIO



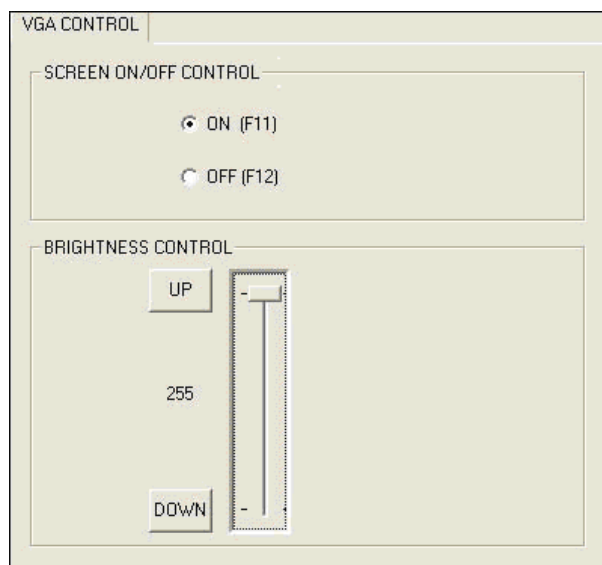
When the application is executed, it will display GPIO information in the GPIO INFORMATION group box. It displays the number of input pins and output pins. You can click the radio button to choose to test either the single pin function or multiple pin functions. The GPIO pin assignments of the supported platforms are located in Appendix B.

- Test Read Single Input Pin
 - Click the radio button- Single-Pin.
 - Key in the pin number to read the value of the input pin. The Pin number starts from '0'.
 - Click the READ GPIO DATA button and the status of the GPIO pin will be displayed in (R/W) Result field.
- Test Read Multiple Input Pin
 - Click the radio button- Multiple-Pins.
 - Key in the pin number from '0x01' to '0x0F' to read the value of the input pin. The pin numbers are ordered bitwise, i.e. bit 0 stands for GPIO 0, bit 1 stands for GPIO 1, etc. For example, if you want to read pin 0, 1, and 3, the pin numbers should be '0x0B'.
 - Click READ GPIO DATA button and the statuses of the GPIO pins will be displayed in (R/W) Result field.
- Test Write Single Output Pin
 - Click the radio button- Single-Pin.
 - Key in the pin numbers you want to write. Pin numbers start from '0'.
 - Key in the value either '0' or '1' in (R/W) Result field to write the output pin you chose above step.
 - Click the WRITE GPIO DATA button to write the GPIO output pin.
- Test Write Multiple Output Pins
 - Click the radio button- Multiple-Pins.
 - Key in the pin number from '0x01' to '0x0F' to choose the multiple pin numbers to write the value of the output pin. The pin numbers are ordered bitwise, i.e. bit 0 stands for GPIO 0, bit 1 stands for GPIO 1, etc. For example, if you want to write pin 0, 1, and 3, the pin numbers should be '0x0B'.
 - Key in the value in (R/W) Result field from '0x01' to '0x0F'™ to write the value of the output pin. The pin numbers are ordered bitwise, i.e. bit 0 stands for GPIO 0, bit 1 stands for GPIO 1, etc. For example, if you want to set pin 0 and 1 high, 3 to low, the pin number should be '0x0B', and then you should key in the value '0x0A' to write.
 - Click the WRITE GPIO DATA button to write the GPIO output pins.

I2C

When the application is executed, you can read or write a byte of data through I2C devices. All data must be read or written in hexadecimal system.

- Read a byte
 - Key in the slave device address in Slave address field.
 - Key in the register offset in Register Offset field.
 - Click the READ A BYTE button and then a byte of data from the device will be shown on the Result field.
- Write a byte
 - Key in the slave device address in Slave address field.
 - Key in the register offset in Register Offset field.
 - Key in the desirous of data in Result field to write to the device.
 - Click the WRITE A BYTE button and then the data will be written to the device through I2C.

Display Control

When the application is executed, it will display two blocks of VGA control functions. The application can turn on or turn off the screen shot freely, and it also can tune the brightness of the panels if your platform is being supported. You can test the functionalities of VGA control as follows:

- Screen on/off control
 - Click the radio button ON or push the key F11 to turn on the panel screen.
 - Click the radio button OFF or push the key F12 to turn off the panel screen.
 - The display chip of your platform must be in the support list in Appendix A, or this function cannot work.
- Brightness control
 - Move the slider in increments, using either the mouse or the direction keys, or click the UP button to increase the brightness.
 - Move the slider in decrements, using either the mouse or the direction keys, or click the DOWN button to decrease the brightness.

Watchdog

The screenshot shows a software interface for configuring and controlling a watchdog timer. It is organized into three distinct sections:

- WATCHDOG INFORMATION:** This section displays three configuration parameters in millisecond (ms) units: 'Min Timeout' is set to 1000, 'Max Timeout' is set to 255000, and 'Timeout Setp' is set to 1000.
- WATCHDOG SETTING:** This section allows for further configuration with two input fields: 'Set Delay' is set to 2000 ms and 'Set Timeout' is set to 3000 ms.
- WATCHDOG CONTROL:** This section features a 'Timeout Countdown' display currently showing 0 ms. Below the display are three control buttons: 'START', 'REFRESH', and 'STOP'.

When the application is executed, it will display watchdog information in the WATCHDOG INFORMATION group box. It displays max timeout, min timeout, and timeout steps in milliseconds. For example, a 1~255 seconds watchdog will have 255000 max timeout, 1000 min timeout, and 1000 timeout steps. You can test the functionality of the watchdog as follows:

- Set the timeout value 3000 (3 sec.) in the SET TIMEOUT field and set the delay value 2000 (2 sec.) in the SET DELAY field, then click the START button. The Timeout Countdown field will countdown the watchdog timer and display 5000 (5 sec.).
- Before the timer counts down to zero, you can reset the timer by clicking the REFRESH button. After you click this button, the Timeout Countdown field will display the value of the SET TIMEOUT field.
- If you want to stop the watchdog timer, you just click the STOP button.

Appendix **A**

Pin Assignments

This appendix contains information of a detailed or specialized nature.

This section includes:

- Jumper and Connector Tables
- Connector Tables

A.1 LVDS Panel Power Select (J1)

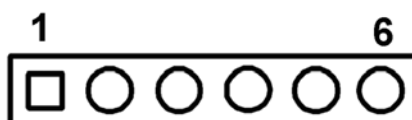


J1	LVDS Panel Power Select
Part Number	1653003100
Footprint	PH_3x1V_2.54mm
Description	PIN HEADER 3*1P 180D(M) 2.54mm DIP WO/Pb
Setting	Function
(1-2)	+V3.3 (Default)
(2-3)	+V5

A.2 COM2 Select (RS232/RS422/RS485) (J2)

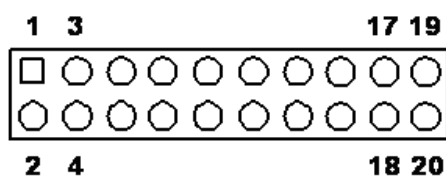
J2	COM2 Select (RS232/RS422/RS485)
Part Number	1653003260
Footprint	PH_3x2V_S2.00mm
Description	PIN HEADER 3*2P 180D(M) 2.0mm SMD SQUARE PIN
Setting	Function
(1-2)	RS232 (Default)
(3-4)	RS485
(5-6)	RS422

A.3 SPI Connector (CN1)



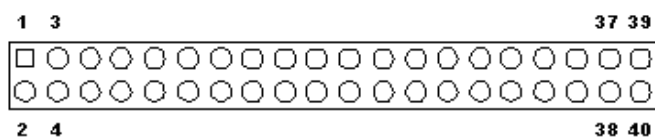
CN1	SPI Connector		
Part Number	1653006101		
Footprint	PH_6x1V_2.00mm		
Description	PIN HEADER 6*1P 180D(M) 2.0mm DIP W/O Pb		
Pin	Pin Name	Signal Type	Signal Level
1	+V3.3_SPI	PWR	
2	GND	GND	
3	SPI_CLK	Out	+3.3V
4	SPI_DO	Out	+3.3V
5	SPI_DI	IN	+3.3V
6	SPI_CS#	Out	+3.3V

A.4 LVDS Connector (CN2)



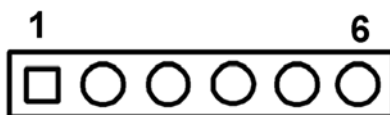
CN2	LVDS Panel Connector		
Part Number	1653910261		
Footprint	DF13_20V_S1.25mm		
Description	CONN. SMD 10*2P 180D(M)DF13-20DP-1.25V(91) HRS		
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	GND	GND	
3	LVDS0_D0+	OUT	
4	NC		
5	LVDS0_D0-	OUT	
6	NC		
7	LVDS0_D1+	GND	
8	NC		
9	LVDS0_D1-	OUT	
10	NC		
11	LVDS0_D2+	OUT	
12	NC		
13	LVDS0_D2-	OUT	
14	NC		
15	LVDS0_CLK+	OUT	
16	LVDS0_D3+	OUT	
17	LVDS0_CLK-	OUT	
18	LVDS0_D3-	OUT	
19	+VLVDS_PANEL	PWR	
20	+VLVDS_PANEL	PWR	

A.5 LCD Panel Connector (CN3)



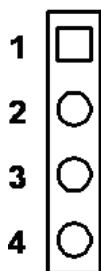
CN3	LCD Panel Connector		
Part Number	1653920200		
Footprint	DF13_40V_S1.25mm		
Description	CONN. 40P 90D 1.25mm SMD WO/Pb DF13-40DP-1.25V		
Pin	Pin Name	Signal Type	Signal Level
1	+V5_LCD	GND	
2	+V5_LCD	PWR	
3	GND	GND	
4	GND	GND	
5	+V3.3_LCD	PWR	
6	+V3.3_LCD	PWR	
7	NC		
8	GND	GND	
9	FP_z_D0	Out	
10	FP_z_D1	Out	
11	FP_z_D2	Out	
12	FP_z_D3	Out	
13	FP_z_D4	Out	
14	FP_z_D5	Out	
15	FP_z_D6	Out	
16	FP_z_D7	Out	
17	FP_z_D8	Out	
18	FP_z_D9	Out	
19	FP_z_D10	Out	
20	FP_z_D11	Out	
21	FP_z_D12	Out	
22	FP_z_D13	Out	
23	FP_z_D14	Out	
24	FP_z_D15	Out	
25	FP_z_D16	Out	
26	FP_z_D17	Out	
27	FP_z_D18	Out	
28	FP_z_D19	Out	
29	FP_z_D20	Out	
30	FP_z_D21	Out	
31	FP_z_D22	Out	
32	FP_z_D23	Out	
33	GND	GND	
34	GND	GND	
35	FP_z_CLK	Out	
36	FP_z_VS	Out	
37	FP_z_DE	Out	
38	FP_z_HS	Out	
39	NC		
40	FP_a_EN	Out	

A.6 PS2 Keyboard/Mouse Connector (CN4)



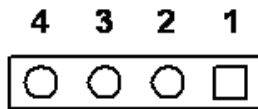
CN4	PS2 Keyboard/Mouse Connector		
Part Number	1655306020		
Footprint	WB_6V_2.0mm		
Description	WAFER BOX 2.0mm 6P 180D(M) W/LOCK		
Pin	Pin Name	Signal Type	Signal Level
1	KB_z_CLK	In	+5V
2	KB_z_DAT	In	+5V
3	MS_z_CLK	In	+5V
4	GND	GND	
5	+5V	PWR	
6	MS_z_DAT	In	+5V

A.7 Power In Connector (CN5)



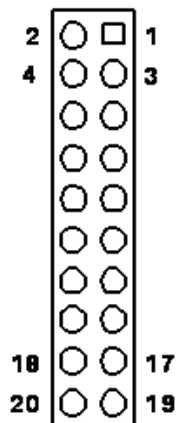
CN5	Power In Connector		
Part Number	1655004110		
Footprint	W_4H_2.5mm		
Description	WAFER 2.5mm 4P 90D(M) DIP W/LOCK W/O Pb		
Pin	Pin Name	Signal Type	Signal Level
1	+12V	PWR	
2	GND	GND	
3	GND	GND	
4	+5V	PWR	

A.8 RS422/RS485 Connector (CN6)



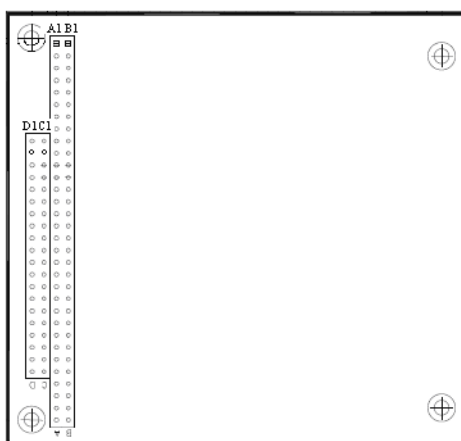
CN6	RS422/RS485 Connector		
Part Number	1655304020		
Footprint	WB_4V_2.0mm		
Description	WAFER BOX 2.0mm 4P 180D(M) W/LOCK A2001WV2-4P		
Pin	Pin Name	Signal Type	Signal Level
1	422_RXD-	In	
2	422_RXD+	In	
3	485-422_TXD+	I/O	
4	485-422_TXD-	I/O	

A.9 COM3/4 Connector (CN7)



CN7	COM3/4 Connector		
Part Number	1653003720		
Footprint	PH_10x2H_S2.00mm		
Description	PIN HEADER 10*2P 2.00mm 90D(M) SMD 21N22050-20J1		
Pin	Pin Name	Signal Type	Signal Level
1	COM3_DCD#	IN	
2	COM3_DSR#	IN	
3	COM3_RXD	IN	
4	COM03_RTS#	I/O	
5	COM3_TXD	OUT	
6	COM3_CTS#	IN	
7	COM3_DTR#	I/O	
8	COM3_RI#	IN	
9	GND	GND	
10	GND	GND	
11	COM4_DCD#	IN	
12	COM4_DSR#	IN	
13	COM4_RXD	IN	
14	COM4_RTS#	I/O	
15	COM4_TXD	OUT	
16	COM4_CTS#	IN	
17	COM4_DTR#	I/O	
18	COM4_RI#	IN	
19	GND	GND	
20	GND	GND	

A.10 PC104 (CN8)



CN8	PC104
Part Number	00A0000005 165312022B 165313222B
Footprint	PC104
Description	
Pin	Pin Name
A1	IOCHCK
A2	SD7
A3	SD6
A4	SD5
A5	SD4
A6	SD3
A7	SD2
A8	SD1
A9	SD0
A10	IOCHRDY
A11	AEN
A12	SA19
A13	SA18
A14	SA17
A15	SA16
A16	SA15
A17	SA14
A18	SA13
A19	SA12
A20	SA11
A21	SA10
A22	SA9
A23	SA8
A24	SA7
A25	SA6
A26	SA5

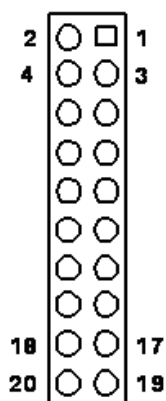
CN8	PC104
Part Number	00A0000005 165312022B 165313222B
Footprint	PC104
Description	
Pin	Pin Name
A27	SA4
A28	SA3
A29	SA2
A30	SA1
A31	SA0
A32	GND
B1	GND
B2	RSTDRV
B3	+5 V

B4	IRQ9
B5	-5V
B6	DRQ2
B7	-12V
B8	OWS#
B9	+12 V
B10	GND
B11	SMEMW
# B12	SMEMR#
B13	IOW#
B14	IOR#
B15	DACK3#
B16	DRQ3
B17	DACK1#
B18	DRQ1
B19	REFRESH#
B20	SYSCLK

CN8	PC104
Part Number	00A0000005 165312022B 165313222B
Footprint	PC104
Description	
Pin	Pin Name
B21	IRQ7
B22	IRQ6
B23	IRQ5
B24	IRQ4
B25	IRQ3
B26	DACK2#
B27	TC
B28	ALE#
B29	+5V
B30	OSC
B31	GND
B32	GND
C1	GND
C2	BHE#
C3	LA23
C4	LA22
C5	LA21
C6	LA20
C7	LA19
C8	LA18
C9	LA17
C10	MEMR#
C11	MEMW#
C12	SD8
C13	SD9

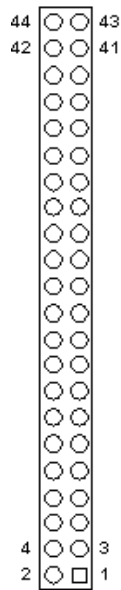
C14	SD10
CN8	PC104
Part Number	00A0000005 165312022B 165313222B
Footprint	PC104
Description	
Pin	Pin Name
C15	SD11
C16	SD12
C17	SD13
C18	SD14
C19	SD15
C20	NC
D1	GND
D2	MEMCS16#
D3	IOCS16#
D4	IRQ10
D5	IRQ11
D6	IRQ12
D7	IRQ15
D8	IRQ14
D9	DACK0#
D10	DRQ0
D11	DACK5#
D12	DRQ5
D13	DACK6#
D14	DRQ6
D15	DACK7#
D16	DRQ7
D17	+5 V
D18	MASTER#
D19	GND
D20	GND

A.11 GPIO Connector (CN9)



CN9	GPIO Connector		
Part Number	1653003720		
Footprint	PH_10x2H_S2.00mm		
Description	PIN HEADER 10*2P 2.00mm 90D(M) SMD 21N22050-20J1		
Pin	Pin Name	Signal Type	Signal Level
1	+5V	PWR	
2	+5V	PWR	
3	GPIO0_P0	I/O	+3.3V
4	GPIO1_P0	I/O	+3.3V
5	GPIO0_P1	I/O	+3.3V
6	GPIO1_P1	I/O	+3.3V
7	GPIO0_P2	I/O	+3.3V
8	GPIO1_P2	I/O	+3.3V
9	GPIO0_P3	I/O	+3.3V
10	GPIO1_P3	I/O	+3.3V
11	GPIO0_P4	I/O	+3.3V
12	GPIO1_P4	I/O	+3.3V
13	GPIO0_P5	I/O	+3.3V
14	GPIO1_P5	I/O	+3.3V
15	GPIO0_P6	I/O	+3.3V
16	GPIO1_P6	I/O	+3.3V
17	GPIO0_P7	I/O	+3.3V
18	GPIO1_P7	I/O	+3.3V
19	GND	GND	
20	GND	GND	

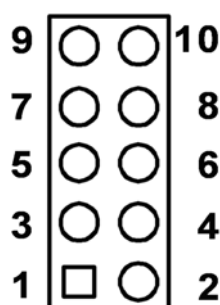
A.12 IDE Connector (CN10)



CN10	IDE Connector		
Part Number	1653222262		
Footprint	BH_22x2V_S2.00mm		
Description	BOX HEADER SMD 22*2P 180D(M) 2.0mm IDIOT-PROOF		
Pin	Pin Name	Signal Type	Signal Level
1	RESET#	Out	
2	GND	GND	
3	DD7	I/O	
4	DD8	I/O	
5	DD6	I/O	
6	DD9	I/O	
7	DD5	I/O	
8	DD10	I/O	
9	DD4	I/O	
10	DD11	I/O	
11	DD3	I/O	
12	DD12	I/O	
13	DD2	I/O	
14	DD13	I/O	
15	DD1	I/O	
16	DD14	I/O	
17	DD0	I/O	
18	DD15	I/O	
19	GND	GND	
21	DMARQ	Out	
22	GND	GND	
23	DIOW#	Out	
24	GND	GND	
25	DIOR#	Out	

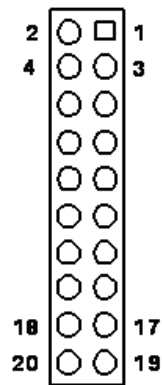
26	GND	GND
27	IORDY	Out
28	CSEL	Out
29	DMACK#	Out
30	GND	GND
31	INTRQ	In
32	NC	
33	DA1	In
34	PDIAG#	In
35	DA0	In
36	DA2	In
37	CS#1	Out
38	CS#3	Out
39	DASP#	Out
40	GND	GND
41	+5V	PWR
42	+5V	PWR
43	GND	GND
44	NC	

A.13 LAN2 Connector (CN11)



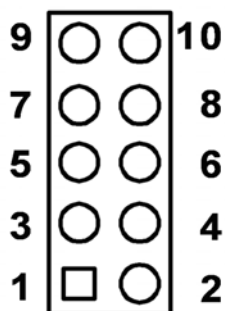
CN11	LAN2 Connector		
Part Number	1653003719		
Footprint	PH_5x2H_S2.00mm		
Description	PIN HEADER 5*2P 2.00mm 90D(M) SMD 21N22050-10J10		
Pin	Pin Name (LPT)	Pin Name (FDD)	Signal Level
1	TGND	GND	
2	TGND	GND	
3	LANM3+	I/O	LAN
4	LANM3-	I/O	LAN
5	LANM2+	I/O	LAN
6	LANM2-	I/O	LAN
7	LANM1+	I/O	LAN
8	LANM1-	I/O	LAN
9	LANM0+	I/O	LAN
10	LANM0-	I/O	LAN

A.14 COM1/2 Connector (CN12)



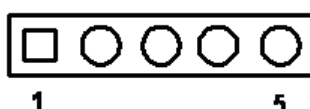
CN12	COM1/2 Connector		
Part Number	1653003720		
Footprint	PH_10x2H_S2.00mm		
Description	PIN HEADER 10*2P 2.00mm 90D(M) SMD 21N22050-20J1		
Pin	Pin Name	Signal Type	Signal Level
1	COM1_DCD#	IN	
2	COM1_DSR#	IN	
3	COM1_RXD	IN	
4	COM1_RTS#	I/O	
5	COM1_TXD	OUT	
6	COM1_CTS#	IN	
7	COM1_DTR#	I/O	
8	COM1_RI#	IN	
9	GND	GND	
10	GND	GND	
11	COM2_DCD#	IN	
12	COM2_DSR#	IN	
13	COM2_RXD	IN	
14	COM2_RTS#	I/O	
15	COM2_TXD	OUT	
16	COM2_CTS#	IN	
17	COM2_DTR#	I/O	
18	COM2_RI#	IN	
19	GND	GND	
20	GND	GND	

A.15 USB1/2 Connector (CN13)



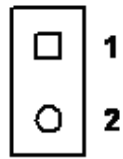
CN13	USB1/2 Connector		
Part Number	1653003718		
Footprint	PH_5x2H_S2.00mm		
Description	PIN HEADER 5*2P 2.00mm 90D(M) SMD No.10		
Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	
2	+5VSB	PWR	
3	USB1_P-	I/O	
4	USB2_P-	I/O	
5	USB1_P+	I/O	
6	USB2_P+	I/O	
7	GND	GND	
8	GND	GND	
9	GND	Chassis GND	

A.16 LVDS Inverter Power Connector (CN14)



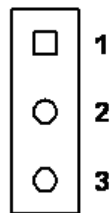
CN14	Inverter Connector		
Part Number	1655000453		
Footprint	WB_5V_2.0mm		
Description	WAFER BOX 2.0mm 5P 180D(M) DIP WO/Pb JIH VEI		
Pin	Pin Name	Signal Type	Signal Level
1	+12V	PWR	
2	GND	GND	
3	VBIASEN	Out	+3.3V
4	VBR	Out	+3.3V
5	+5V	PWR	

A.17 System Reset Connector (CN15)



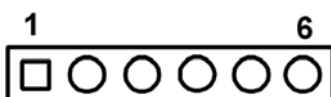
CN15	System Reset Connector		
Part Number	1655302020		
Footprint	WB_2V_2.00mm		
Description	WAFER BOX 2P 180D(M) 2.0mm W/Lock		
Pin	Pin Name	Signal Type	Signal Level
1	Reset	In	+3.3V
2	GND	GND	

A.18 -12V / -5V Power In Connector (CN16)



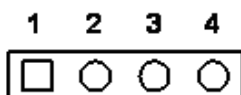
CN16	-12V / -5V Power In Connector		
Part Number	1653003101		
Footprint	PH_3x1V_2.00mm		
Description	PIN HEADER 3*1P 180D(M) 2.0mm DIP SQUARE W/O Pb		
Pin	Pin Name	Signal Type	Signal Level
1	-5V	PWR	
2	GND	GND	
3	-12V	PWR	

A.19 JTAG Connector (CN17)



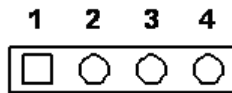
CN17	JTAG Connector		
Part Number	1653006101		
Footprint	PH_6x1V_2.00mm		
Description	PIN HEADER 6*1P 180D(M) 2.0mm DIP W/O Pb		
Pin	Pin Name	Signal Type	Signal Level
1	+5V	PWR	
2	GND	GND	
3	TCK	In	+3.3V
4	TDO	Out	+3.3V
5	TDI	In	+3.3V
6	TMS	In	+3.3V

A.20 PWR / HDD LED Connector (CN18)



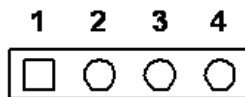
CN18	PWR / HDD LED Connector		
Part Number	1653004101		
Footprint	PH_4x1V_2.00mm		
Description	PIN HEADER 4*1P 180D(M) 2.0mm DIP WO/Pb		
Pin	Pin Name	Signal Type	Signal Level
1	PWR_LED+	Out	+5V
2	PWR_LED-	In	
3	HDD_LED+	Out	+3.3V
4	HDD_LED-	In	+3.3V

A.21 LAN1 LED Connector (CN19)



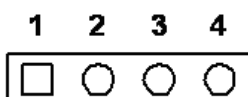
CN19	LAN1 LED Connector		
Part Number	1653004101		
Footprint	PH_4x1V_2.00mm		
Description	PIN HEADER 4*1P 180D(M) 2.0mm DIP WO/Pb		
Pin	Pin Name	Signal Type	Signal Level
1	ACT_LED+	Out	+3.3V
2	LINK_LED-	IN	+3.3V
3	ACT_LED-	IN	+3.3V
4	LINK_LED+	Out	+3.3V

A.22 I2C Connector (CN20)



CN20	I2C Connector		
Part Number	1653004101		
Footprint	PH_4x1V_2.00mm		
Description	PIN HEADER 4*1P 180D(M) 2.0mm DIP WO/Pb		
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	I2C_SDA	I/O	+3.3V
3	I2C_SCL	Out	+3.3V
4	+5V	PWR	

A.23 LAN2 LED Connector (CN21)



CN21	LAN2 LED Connector		
Part Number	1653004101		
Footprint	PH_4x1V_2.00mm		
Description	PIN HEADER 4*1P 180D(M) 2.0mm DIP WO/Pb		
Pin	Pin Name	Signal Type	Signal Level
1	ACT_LED+	Out	+3.3V
2	100LINK_LED-	I/O	+3.3V
3	ACT_LED-	IN	+3.3V
4	1GLINK_LED-	I/O	+3.3V

A.24 VGA Connector (CN22)

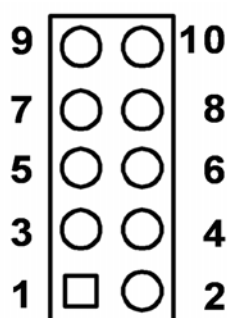
CN22	VGA Connector		
Part Number	1655912120		
Footprint	WB_12H_S1.25mm		
Description	Wafer Box 1.25mm 12P 90D(M) SMD 85204-12001		
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	VGA_R	Out	
3	VGA_G	Out	
4	VGA_B	Out	
5	GND	GND	
6	NC		
7	DDC_DATA	I/O	+5V
8	DDC_CLK	Out	+5V
9	GND	GND	
10	HSYNC	Out	+5V
11	VSYNC	Out	+5V
12	GND	GND	
13	GND	GND	
14	GND	GND	

A.25 CF Socket (CN23)

CN23	CF Socket		
Part Number	1653050111		
Footprint	CFTYPEII_50		
Description	CF Header Typell 50P 90D(M) Standoff 60311220		
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	IDE_PDD3	I/O	
3	IDE_PDD4	I/O	
4	IDE_PDD5	I/O	
5	IDE_PDD6	I/O	
6	IDE_PDD7	I/O	
7	IDE_PDCS#1	OUT	
8	GND	GND	
9	GND	GND	
10	GND	GND	
11	GND	GND	
12	GND	GND	
13	+5V	PWR	
14	GND	GND	
15	GND	GND	
16	GND	GND	
17	GND	GND	
18	IDE_PDA2	IN	
19	IDE_PDA1	IN	
20	IDE_PDA0	IN	
21	IDE_PDD0	I/O	
22	IDE_PDD1	I/O	
23	IDE_PDD2	I/O	
24	NC		
25	GND	GND	
26	NC		
27	IDE_PDD11	I/O	
28	IDE_PDD12	I/O	
29	IDE_PDD13	I/O	
30	IDE_PDD14	I/O	
31	IDE_PDD15	I/O	
32	IDE_PDCS#3	OUT	
33	NC		
34	IDE_PDIOR#	OUT	
35	IDE_PDIOW#	OUT	
36	IDE_WE#	OUT	
37	IDE_IRQ	IN	
38	+5V	PWR	
39	CF_CSEL#	OUT	
40	NC		

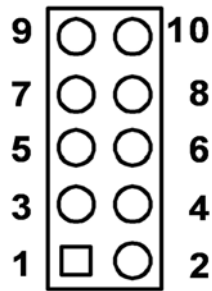
41	RESET#	OUT
42	IDE_PDIORDY	OUT
43	IDE_PDDREQ	OUT
44	IDE_PDDACK#	OUT
45	IDEACTS#	I/O
46	IDE_P66DET#	IN
47	IDE_PDD8	I/O
48	IDE_PDD9	I/O
49	IDE_PDD10	I/O
50	GND	

A.26 LAN1 Connector (CN24)



CN24	LAN1 Connector		
Part Number	1653003719		
Footprint	PH_5x2H_S2.00mm		
Description	PIN HEADER 5*2P 2.00mm 90D(M) SMD 21N22050-10J10		
Pin	Pin Name	Signal Type	Signal Level
1	GNDT	GND	
2	GNDT	GND	
3	Termination		
4	Termination		
5	Termination		
6	Termination		
7	LAN1_RX+	I/O	
8	LAN1_RX-	I/O	
9	LAN1_TX+	I/O	
10	LAN1_TX-	I/O	

A.27 USB3/4 Connector (CN25)



CN25	USB3/4 Connector		
Part Number	1653003718		
Footprint	PH_5x2H_S2.00mm		
Description	PIN HEADER 5*2P 2.00mm 90D(M) SMD No.10		
Pin	Pin Name	Signal Type	Signal Level
1	+5V	PWR	
2	+5V	PWR	
3	USB3_P-	I/O	
4	USB3_P+	I/O	
5	USB4_P-	I/O	
6	USB4_P+	I/O	
7	GND	GND	
8	GND	GND	
9	GND	GND	

Appendix **B**

IO System Assignment

B.1 System I/O Ports

Table B.1: System I/O Ports

Addr. Range (Hex)	Device
00h-1Fh	DMA Controller
20h-21h	Interrupt Controller
40h-48h	Timer/Counter
50h-52h	Timer/Counter
60h	Keyboard controller
64h	Keyboard controller
70h-71h	RTC & CMOS
81h-8Fh	DMA Controller
92h	Reset Generator
A0h-A1h	Interrupt Controller
C0h-DEh	DMA Controller
170h-177h	IDE Controller
1F0h-1F7h	IDE Controller
3F8-3FF	
3E8-3EF	
2F8-2FF	
2E8-2EF	
2F0-2F7	
2E0-2E7	
3E0-3E7	
3B8-3BF	COM Port
220-227	
228-22F	
238-23F	
278-27F	
338-33F	
378-37F	

B.2 1st MB memory map

Table B.2: 1st MB memory map

Addr. Range (Hex)	Device
F0000h - FFFFFh	Upper BIOS Area (64kB)
E0000h - EFFFFh	Lower BIOS Area (64kB) 16kB x 41
C0000h - DFFFFh	Expansion Card BIOS and Buffer Area (128kB) 16kB x8
A0000h - BFFFFh	Standard PCI/ISA Video Memory (SMM Memory) 128kB
00000h - 9FFFFh	DOS Area

B.3 DMA channel assignments

Table B.3: DMA channel assignments

Channel	Function
0	Available
1	Available
3	Available
5	Available
6	Available
7	Available

B.4 Interrupt assignments

Table B.4: Interrupt assignments

Interrupt#	Interrupt source
IRQ0	Interval timer
IRQ1	Keyboard
IRQ2	Interrupt from controller 2 (cascade)
IRQ3	COM2
IRQ4	COM1
IRQ5	COM3
IRQ6	Reserved
IRQ7	COM4
IRQ8	Redirected IRQ2
IRQ9	Reserved
IRQ10	Reserved
IRQ11	Reserved
IRQ12	Reserved
IRQ13	Math Coprocessor
IRQ14	Fixed Disk
IRQ15	Reserved

Appendix **C**

Watchdog Timer and
GPIO Sample Code

C.1 Watchdog Timer and GPIO Sample Code

C.1.1 [PCM-3343 WDT]

Note : Index port(22h) = 13h, Data port(23h) = C5h :

Unlock function port 22h/23h for GPIO/WDT0 works.

Index port(22h) = 13h, Data port(23h) = 00h :

Lock GPIO/WDT0 function.

1. WDT0 GPIO Registers

Index port(22h) = 37h, Data port(23h) definition :

WDT1 control register of bit 6 is enable WDT 1 control

Index port(22h) = 38h, Data port(23h) definition :

WDT1 signal select control register of bit 7-4 set 1101b as system reset.

Index port(22h) = 39h / 3Ah / 3Bh, Data port(23h) definition :

WDT1 of counter 0~3 register, bit 7-0 resolution is 30.5us.

2. WDT1 GPIO Registers

IO port 68h: WDT1 control register of bit 6 is enable WDT 1 control

IO port 69h: WDT1 signal select control register of bit 7-4 set 1101b as system reset.

IO port 6Ah / 6Bh / 6Ch : WDT1 of counter 0~3 register, bit 7-0 resolution is 30.5us.

Sample code:

```
.model small
.286p
.stack
.data
.code
main:
    xor al,al    ;clear al value
    out 68h,al
    mov al,0D0h ;Issue system reset
        out 69h,al
        mov al,00h ;count 0
        out 6ah,al
        mov al,00h ;count 1
        out 6bh,al
        mov al,03h ;count 2
        out 6ch,al
        mov al,040h ;enabled WDT function
        out 68h,al
    mov ah,4ch
    int 21
end
```

It will reboot after 5 seconds.

C.1.2 [PCM-3343 GPIO]

1. GPIO Registers

IO port 98h: GPIO 0 Direction register (0 = Input / 1= Output).

IO port 99h: GPIO 1 Direction register (0 = Input / 1= Output).

IO port 78h: GPIO data port 0 base address (0 = Low / 1 = High).

IO port 79h: GPIO data port 1 base address (0 = Low / 1 = High).

2. Sample Code

```
.model small
.286p
.stack
.data
.code
main:
    mov dx, 98h ;GPIO 0 Direction port
    mov al, 0FFh ;Set GPIO 0 of 0 ~ 7 as output type.
    out dx, al

    inc dx ;Set 99h GPIO 1 Direction port
    out dx, al ;Set GPIO 1 of 0 ~ 7 as output type.

    mov dx, 78h ;GPIO data port 0 base address
    mov al, 55h ;Set GPIO 0 of GPIO 0, 2, 4, 6 as high, 1, 3, 5, 7 as low.
    out dx, al
    inc dx ;Set GPIO data port 1 base address

    mov al, 0AAh ;Set GPIO 1 of GPIO 1, 3, 5, 7 as high, 0, 2, 4, 6 as low.
    out dx, al

    mov ah,4ch
    int 21
    end
```



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