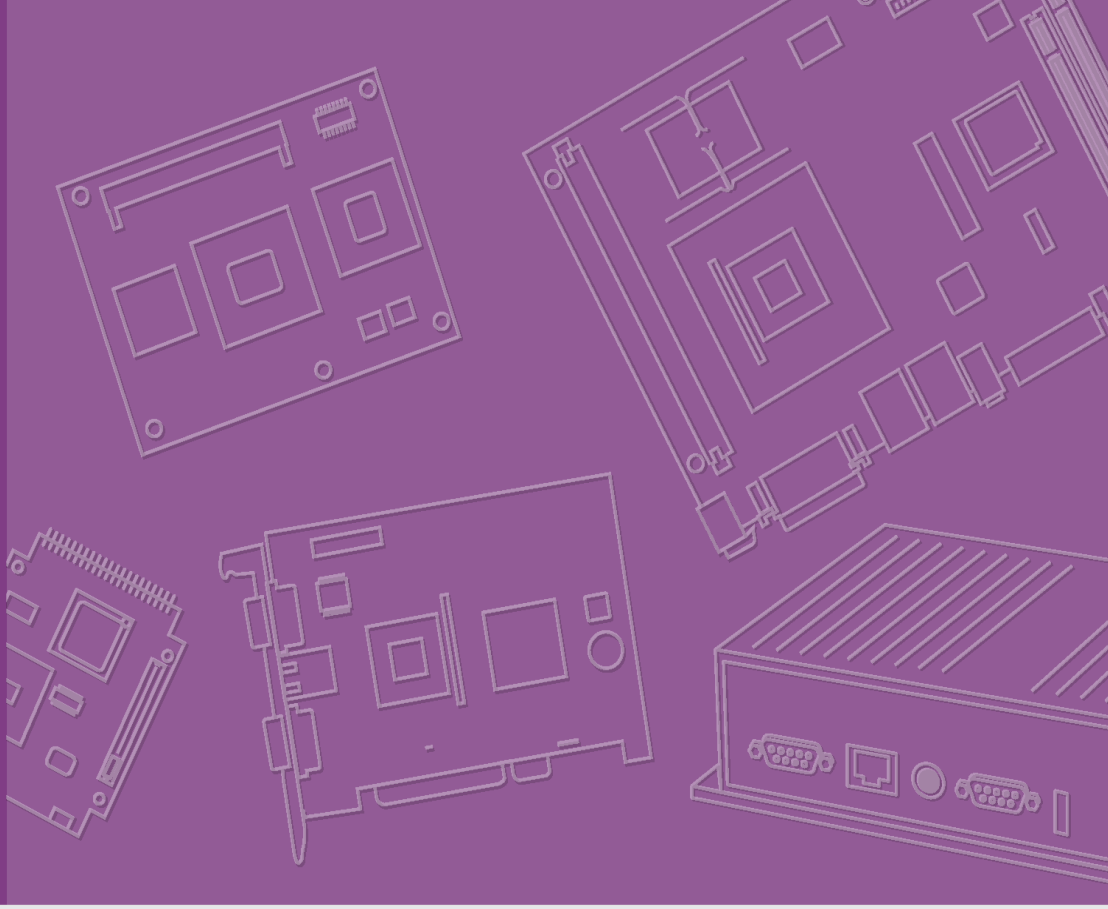

User Manual

PCM-3363

PCI-104 SBC w/Intel® Atom™ N455/D525, VGA, LVDS, Gigabit Ethernet, USB2.0, SATA, and on-board memory

ADVANTECH

Enabling an Intelligent Planet

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http://www.advantech.com/support

This manual is for the PCM-3363.

Part No. 2006336310 Edition 1

Printed in China May 2011

Packing List

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

■ 1 x PCM-3363 SBC	
■ 1 x SATA data cable 7p 32 cm (w/locked)	(p/n: 1700008941)
■ 1 x SATA power cable	(p/n: 1703150102)
■ 1 x Keyboard/Mouse cable	(p/n: 1703060053)
■ 1 x Y cable for KB/MS extension	(p/n: 1700060202)
■ 1x Ethernet cable RJ45/2*5P-2.0 15 cm (w/locked)	(p/n: 1700019001)
■ 1 x VGA cable	(p/n: 1700000898)
■ 1 x USB cable 2port 2.0 mm pitch w/bracket 26 cm (w/locked)	(p/n: 1700019000)
■ 1 x RS-422/485 COM cable	(p/n: 1703040157)
■ 1 x RS-232 x 2 ports 2.0 mm 22 cm (w/ locked)	(p/n: 1700018999)
■ 1 x AT Power cable	(p/n: 1700003491)
■ Cooler for PCM-3363D only	(p/n: 1960051405N001)
■ Heatsink for PCM-3363N only	(p/n: 1960051403N001)
■ Heatsink for PCM-3363Z series only	(p/n: 1960051404N001)
■ 1 x Startup manual	
■ 1 x DVD-ROM (Manual, Driver, Utility)	

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

Model No.List	Description
PCM-3363N-1GS6A1E	PC/104 SBC w/Intel® Atom N455, VGA, LVDS, Gigabit Ethernet, USB,SATA, on-board memory
PCM-3363D-1GS8A1E	PC/104 SBC w/Intel® Atom D525, VGA, LVDS, Gigabit Ethernet, USB,SATA, on-board memory

Optional Accessory

1 x heatspreader	(p/n:1960047106T001)
PCI-104 extension connector	(p/n: 1653130421)
Audio Extension module with bracket	(p/n: PCA-AUDIO-HDA1E)
Audio cable for PCA-AUDIO-HDA1E	(p/n: 1700018427)

Additional Information and Assistance

1. Visit the Advantech web site at www.advantech.com 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

Declaration of Conformity

This device complies with the requirements in part 15 of the FCC rules: Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation

FCC Class A

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. Opera- thin 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 manflatterer. Discard used batteries according to the manufacturer's instructions.*

Contents

Chapter 1

General Information

This chapter gives background information on the PCM-3363.

Sections include:

- Introduction
- Features
- Specifications
- Board layout and dimensions

1.1 Introduction

The PCM-3363 is a fanless, low power, small size (96X90mm), performance PCI-104 SBC (Single Board Computer) geared to satisfy the needs for various industrial computing equipment. PCM-3363 is ideal for communication, environment monitoring, factory automation, military, and medical applications that require flat panel support using digital displays with LVDS interfaces and single Ethernet port.

For those who want superior performance for various low-power embedded applications, PCM-3363 uses an Intel® Atom™ N455/D525 processor, supporting on-board 1 GB DDRIII 800MHz SDRAM.

PCM-3363 has an integrated graphics controller contains a refresh of the 3rd generation graphics core with 224 MB shared memory. This feature makes PCM-3363 is capable of handling complex and intense 2D/3D graphic processing, its CRT and LVDS dual display ports also makes it suitable for applications requiring multiple display configurations or digital panel display capabilities.

PCM-3363 equips convenient and locked connector to offer multiple I/Os including single 10/100/1000 Mbps Ethernet, four USB (Universal Serial Bus) 2.0, one SATA2 interface, 8-bit general purpose Input/Output, two RS-232 serial ports and one RS-422/485 serial port for easy and reliable system expansibility. PCI-104 self-stacking rugged mechanical architecture and extended temperature operation makes it ideal for outdoor applications in military and transportation fields.

PCM-3363 has built-in Lite iManager to provide "Extreme Cold Start guaranteed" and "Voltage Dip protection Capacity" function in default. It also can support numerous operating systems including Windows 7, Windows XP, Windows Embedded Standard, Windows CE, Linux, QNX and VxWorks. PCM-3363 offers drivers and rich software API for application development including SMBus, GPIO, Watchdog Timer, Hardware Monitor and Brightness Control.

1.2 Specifications

1.2.1 Functional Specifications

1.2.1.1 Processor: Intel® Atom™ Processor Series

- N455 1.66 GHz single-core/ D525 1.8 GHz dual-cores
- On die, primary 32 KB instructions cache and 24 KB write-back data cache
- Intel® Hyper-Threading Technology 2-thread per core
- On die 512 KB, 8-way L2 cache for N455; On die 2 x 512 KB, 8-way L2 cache
- Support IA 32-bit and Intel® 64 architecture
- Thermal management support via Intel® Thermal Monitor (TM1)
- Enhanced Intel® SpeedStep Technology (EIST) for N455 only

1.2.1.2 Chipset: Intel® ICH8M I/O Controller

- Direct Media Interface: 10 Gb/s each direction, full duplex
- Supports PCI Rev 2.3 at 33 MHz and 64-bit addressing using DAC protocol
- Integrated Serial ATA Host and AHCI Controller
- Integrated PATA Controller supports Ultra ATA, BMIDE and PIO modes
- USB 2.0: UHCI Host and EHCI Host Controllers
- Integrated Gigabit Ethernet Controller

1.2.1.3 System Memory Support

- Onboard 1GB DDRIII 800MHz SDRAM
- Memory data transfer rates of 667 (N455) and 800 (D525) MT/s

1.2.1.4 Integrated Graphics Controller

- Contains a refresh of the 3rd generation graphics core
- Directx* 9 compliant Pixel Shader* v2.0
- 200 MHz (N455) and 400 MHz (D525) render clock frequency
- 224 MB Video RAM shared with system memory
- Two display ports: LVDS and analog RGB
- Support Extend and Clone mode under Dual Display
- Integrated single LVDS channel support resolution up to 1366 x 768 pixels
- Analog RGB display output up to resolution 1400 x 1050 @ 60 Hz (N455) and 2048 x 1536 @ 60 Hz (D525)
- Intel® Clear Video Technology: MPEG2 Hardware Acceleration

1.2.1.5 Gigabit Ethernet

- ICH8M (MAC) + 82567 GbE (PHY)
- Supports IEEE 802.3
- LAN Connect Interface (LCI) and new Gigabit LAN Connect Interface (GLCI)
- 10/100/1000 Mb/s Ethernet Support

1.2.1.6 Peripheral interface

- PCI-104 expansion (PCI Bus only)
- One Serial-ATA port, up to 3.0 Gb/s (300 MB/s)
- One CompactFlash® Card TYPE I/II socket
- Four USB 2.0 compliant ports
- Two RS-232 from COM1/2, 1 RS-422/485 from COM3 (ESD protection for RS-232: Air gap ±15 kV, Contact ±8 kV)
- One SMBus (allow to configure to I^2C by customer's request)
- Supports standard PC/AT keyboard and PS/2 mouse
- 8-bit Programmable General Purpose Input/ Output
- Watchdog timer: Output System Reset, Programmable counter from 1 ~ 255 minutes/ seconds
- High Definition Audio: PCM-3363 can provide audio function with the optional audio extension module: PCA-AUDIO-HDA1E

1.2.1.7 BIOS

- AMI 16Mbit SPI Flash ROM

1.2.2 OS support

PCM-3363 supports Win7, Win XP, Win CE, WES7 and WES

For further information about OS support PCM-3363, please visit Advantech website: www.advantech.com or contact the technical support center.

1.2.3 Mechanical Specifications

- **Dimensions:** 96 x 90 mm (3.8" x 3.5")
- **Height:** Top Side: 14.4mm (N455), 19.4mm (D525, Wide Temp version);
  Bottom Side: 10.6mm
- **Weight:** 0.85 kg (reference weight of total package)

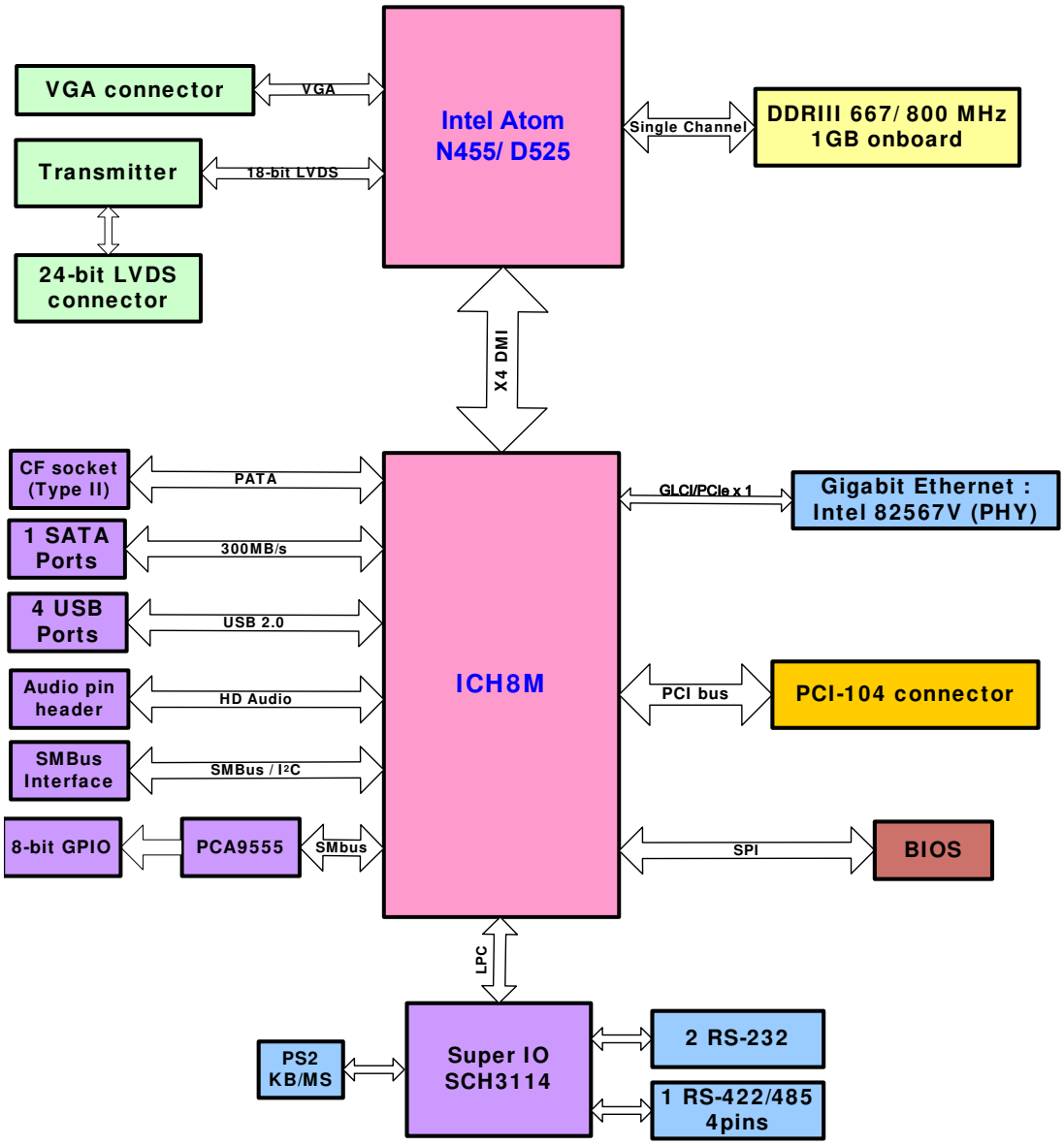
1.2.4 Electrical Specifications

- **Power Supply Type:** AT
  Power Management: ACPI 2.0
- **Power Requirement:** +5V_{DC} ±5% only for boot up (+12 V optional for PCI-104 add-on card and LCD inverter)
- **Power Consumption:**
  - **Power on:** 1.767 A @ +5 V (N455), 2.281 A @ +5 V (D525)
  - **Max load:** 2.365 A @ +5 V (N455), 2.695 A @ +5 V (D525)
  - **Idle mode:** 1.404 A @ +5 V (N455), 1.85 A @ +5 V (D525)
- **Power Consumption Conditions:**
  - **Test software:** Maxpower + 3DMark 2005
  - **Power on - Boot:** Measure the maximum current value between system power on and boot-up to O.S.
  - **Max. load:** Measure the maximum current value which system under maximum load (CPU: Top speed, RAM &Graphic: Full loading)
  - **Idle mode:** Measure the current value when system in windows mode and without running any program
- **RTC Battery:**
  - **Typical Voltage:** 3.0 V
  - **Normal discharge capacity:** 210 mAh

1.2.5 Environmental

- **Operating temperature:** 0 ~ 60° C (32 ~ 140° F)
- **Operating Humidity:** 40° C @ 85% RH Non-Condensing
- **Storage Temperature:** Storage temperature: -20~70° C
- **Storage Humidity:** Relative humidity: 95% @ 60° C

1.3 Block Diagram



1.4 Board layout: dimensions

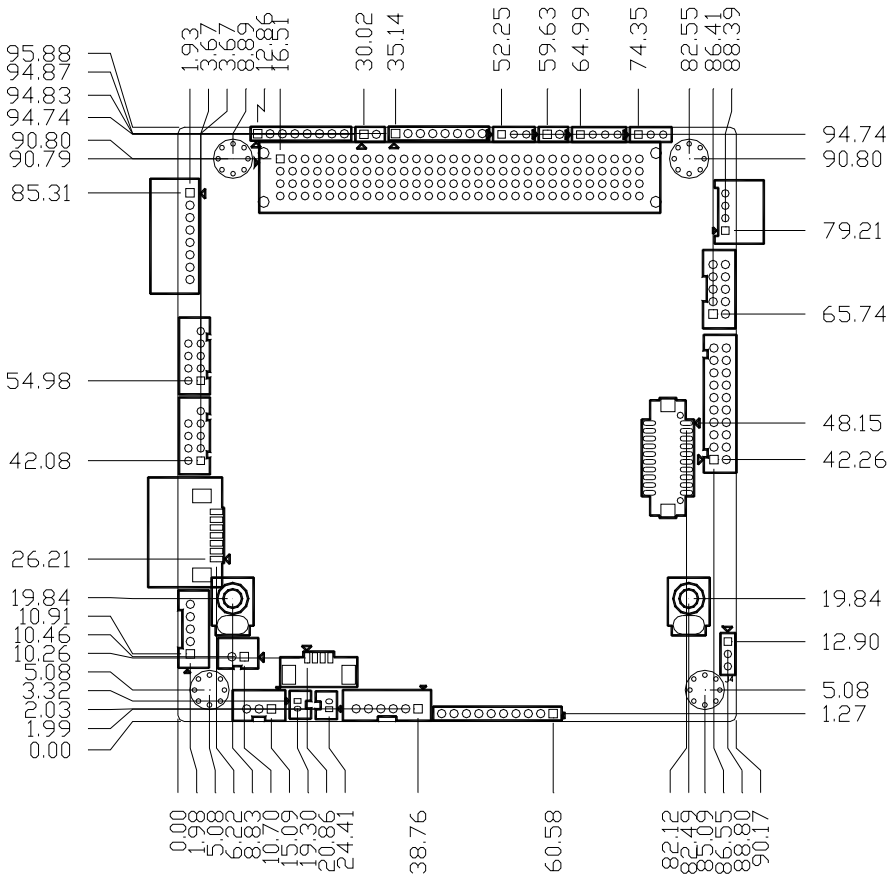


Figure 1.1 Board layout: Dimensions (Component Side)

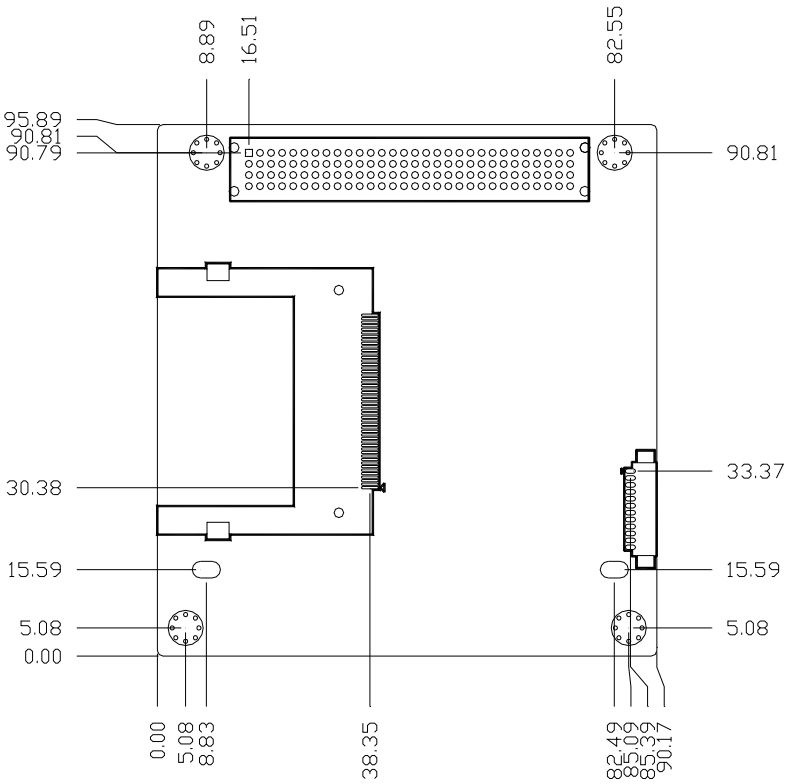


Figure 1.2 Board layout: Dimensions (Solder Side)

Chapter 2

Hardware Installation

2.1 Jumpers

The PCM-3363 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	
J1	AT/ATX Power Setting
J2	RS485/422 Setting
J3	PCI VIO Setting
J4	LCD Power

2.2 Connectors

Table 2.2: Connectors	
Label	**Function**
CN1	Power Input
CN2	BIOS Socket
CN3	VGA
CN4	Front Panel
CN5	CF
CN6	SATA
CN7	SATA Power
CN8	Internal USB
CN9	Internal USB
CN10	COM1/COM2
CN12	RS422/485
CN13	PS/2
CN14	HD Audio
CN15	SMBus (I^2C)
CN16	CPU FAN (+5 V)
CN17	GPIO
CN18	Gigabit Ethernet
CN21	Buzzer
CN22	PCI-104
CN23	PCI-104 -12V Input
CN24	Inverter Power Output
CN25	24-bit LVDS Panel
BH1	RTC Battery Connected

2.3 Locating Connectors & block diagram

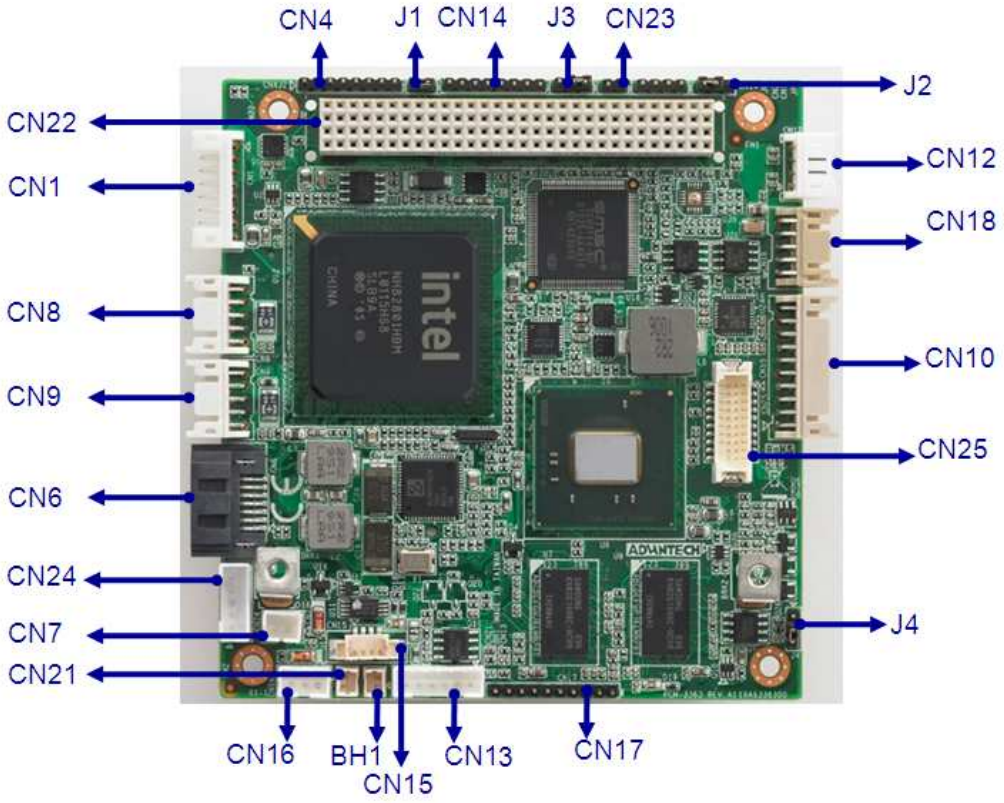


Figure 2.1 Connectors (component side)

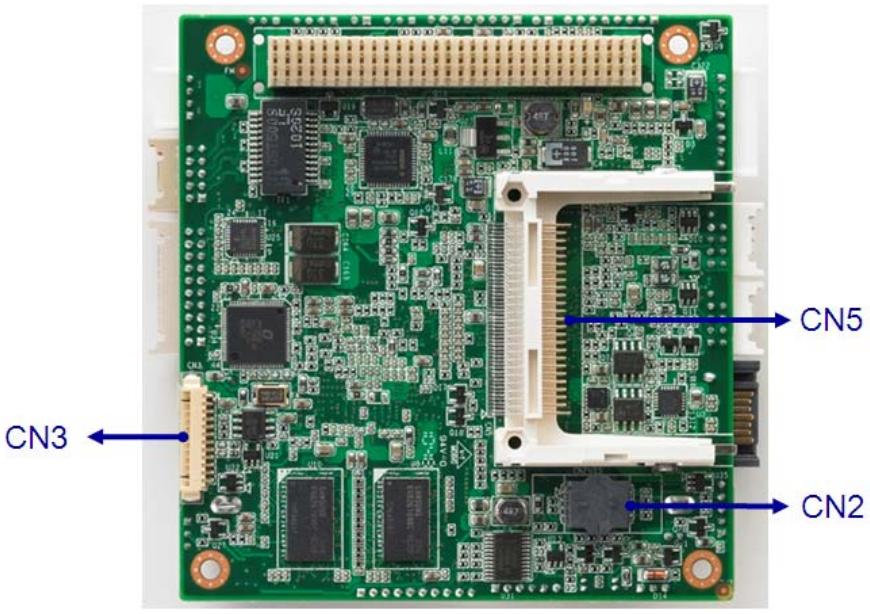
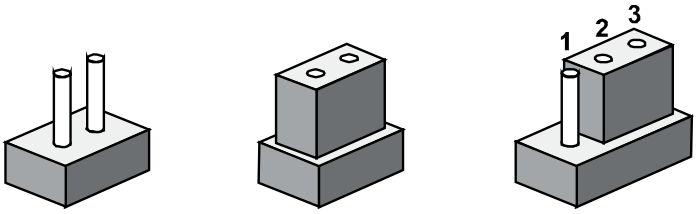


Figure 2.2 Connectors (solder side)

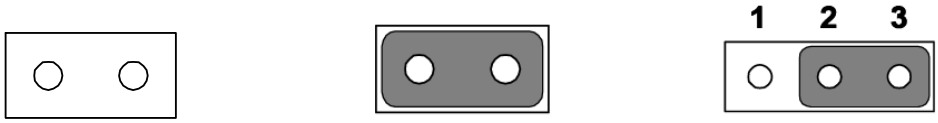
2.4 Setting Jumpers

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.



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.

2.4.1 AT/ATX Power Setting (J1)

The PCM-3363 single board computer contains a jumper that can switch the AT/ATX Power Setting. Normally this jumper should be set with closed. It will send the power button signal to power on the system automatically. It also can keep open to power on the system by power button switch.

Table 2.3: AT/ATX Power Setting (J1)

Setting	Function
Closed	AT power (default)
Open	ATX power

2.4.2 COM3 RS422/RS485 Select (J2)

Table 2.4: COM3 RS422/RS485 Select (J2)

Setting	Function
1-2	RS-485
2-3	RS-422

2.4.3 PCI I/O Voltage Select (J3)

The PCI Host board will always determine the PCI signaling level on the bus by setting all VI/O pins to either 3.3V or 5V. If VI/0 is set to 3.3V,then the system will use 3.3V I/O signaling, likewise, if VI/O is set to 5V,then the system will use 5V I/O signaling. Some PCI host modules may only allow one of the options, while others may provide a jumper to allow the user to select the signaling level. Once the signaling level is selected, the remaining boards in the system must use that signaling level.

Table 2.5: PCI I/O Voltage Select (J3)

Setting	Function
1-2	5 V
2-3	3.3 V

2.4.4 LVDS Panel Power Select (J4)

Table 2.6: LVDS Panel Power Select (J4)

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

2.5 CompactFlash

The CompactFlash card can be enabled/disabled via the BIOS settings.

2.6 VGA/LCD interface connections

The PCM-3363's VGA interface can drive conventional CRT displays and is capable of driving a wide range of LVDS flat panel displays. The board has two connectors to support these displays: one for standard CRT VGA monitors, one for LVDS type LCD panels.

2.6.1 CRT display connector

CN3 is a 12-pin, dual-inline header used for conventional CRT displays. A simple one-to-one adapter can be used to match CN3 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 SXGA 1400 x 1050 @ 60 Hz. Pin assignments for CRT display connector CN3 are detailed in Appendix A.

2.6.2 LVDS connector

The PCM-3363 uses the Intel® Atom N455/D525 that supports single-channel 24-bit LVDS panel up to 1366 x 768 pixels panel resolution.

2.6.3 Panel Inverter Power

The LCD inverter is connected to CN24 via a 5-pin connector to provide +5 V/+12 V power to the LCD display. J4 provides LVDS voltage selection function, closing Pin 1, 2 is for 5 V LVDS power input; closing Pin 2, 3 is for 3.3 V LVDS power input.

2.7 USB connectors

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

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.

2.8 Front Panel Connector

Power Button(Pin1 & Pin2)

PCM-3363 supports power on/off button in ATX mode.

Reset (Pin3 & Pin4)

If you install a reset switch, it should be an open single pole switch.

Momentarily pressing the switch will activate a reset.

POWER LED (Pin5 & Pin6)

POWER LED indicator would light when the power is on.

HDD LED (Pin7 & Pin8)

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

2.9 Buzzer Connector

PCM-3363 provides one buzzer connector to connect buzzer for alert function. Buzzer, Advantech's P/N:1750005282, can be selected to install on board.

2.10 SATA Connector

PCM-3363 features one high performance Serial ATA interfaces (up to 300 MB/s) that eases cabling to hard drives with thin and long cables while application need larger storage capacity.

PCM-3363 also equip one SATA power connector. It only can supply 5 V and less than 500 mA current to the Hard Drive.

2.11 COM port connector

The board provides three serial ports: two serial RS-232 ports in one 20 pin connector (CN10:COM1/2), and one serial port RS422/485 in 4 pin connector(CN12: COM3).

It provides connections for serial devices or a communication network. The pin assignments for the COM port connector can be found in Appendix.

2.11.1 Serial Port RS-422/485

COM3 (CN12) can be configured to operate in RS-422 or RS-485 mode by J2.

2.12 Gigabit Ethernet Connector

PCM-3363 uses the Intel® 82567V Gigabit Ethernet chips are linked to dedicated PCIe x1 lanes. PCM-3363 provide high throughputs for heavy loading networking environment.

2.13 Keyboard and PS/2 mouse connector

The board provides a keyboard connector that supports both a keyboard and a PS/2 style mouse.

2.14 GPIO Connector

The board supports 8-bit GPIO through CN17. The 8 digital inputs and outputs can be programmed to read or control devices, with each input or output defined.

2.15 Power Input Connectors

Supplies main power +5 V to the PCM-3363, and to devices that require +12 V

2.16 SMBus connector

PCM-3363 provides SMBus connector for customer connection to SMBus protocol embedded device. It can be configured to I2C by customer's request

Advantech also provide SMBus API allowing a developer to interface with an embedded system environment and transfer serial messages using the SMBus protocols, allowing multiple simultaneous device control.

2.17 -12 V power connector

The PCM-3363 is equipped with a Negative Power Input connector providing -12 V power if applications happen to need it.

2.18 High Definition Audio Interface

The PCM-3363 provides high definition audio interface. It can support high definition audio stereo by customized audio module that has codec onboard or by Advantech's PCA-AUDIO-HDA1E module through specific cable.

2.19 Watchdog Timer Configuration

An onboard watchdog timer reduces the chance of disruptions which EMP (electro-magnetic pulse) interference can cause. This is an invaluable protective device for standalone or unmanned applications. Setup by running the control software (refer to Appendix).

Chapter 3

AMI BIOS Setup

AMIBIOS has been integrated into kajillions of motherboards for well over a decade. With the AMIBIOS Setup program, you can modify BIOS settings and control the various system features. This chapter describes the basic navigation of the PCM-3363 BIOS setup screens.

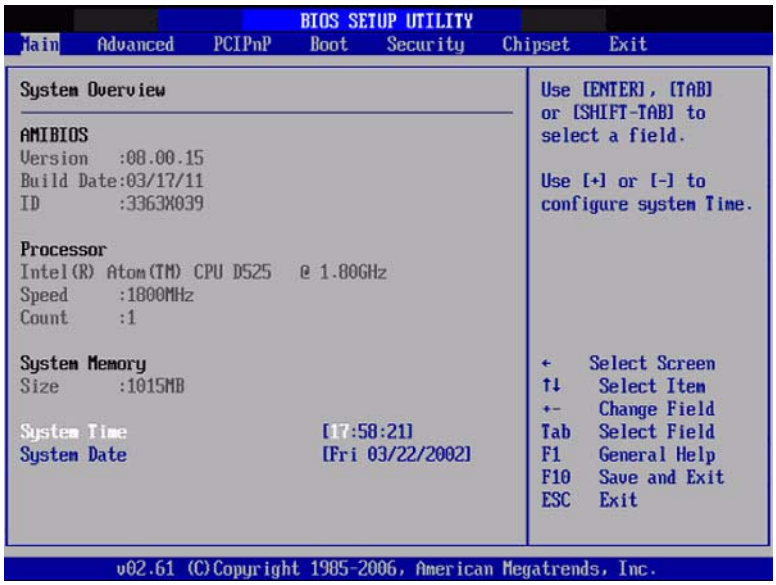


Figure 3.1 Setup program initial screen

AMI's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This information is stored in battery-backed CMOS so it retains the Setup information when the power is turned off.

3.1 Entering Setup

Turn on the computer and check for the "patch" code. If there is a number assigned to the patch code, it means that the BIOS supports your CPU. If there is no number assigned to the patch code, please contact an Advantech application engineer to obtain an up-to-date patch code file. This will ensure that your CPU's system status is valid. After ensuring that you have a number assigned to the patch code, press <DEL> and you will immediately be allowed to enter Setup.

3.2 Main Setup

When you first enter the BIOS Setup Utility, you will encounter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.

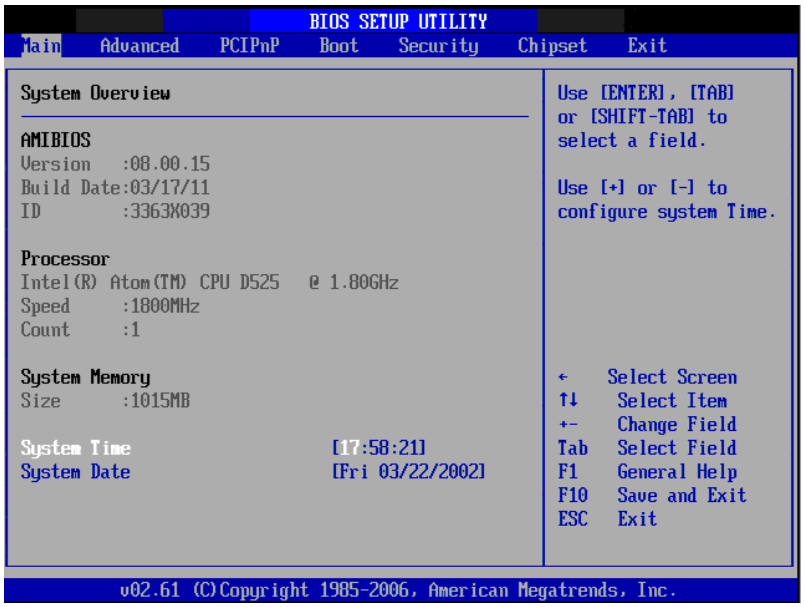


Figure 3.2 Main setup screen

The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can. The right frame displays the key legend.

Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

3.2.1 System time / System date

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

3.3 Advanced BIOS Features Setup

Select the Advanced tab from the PCM-3363 setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as CPU Configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screens is shown below. The sub menus are described on the following pages.

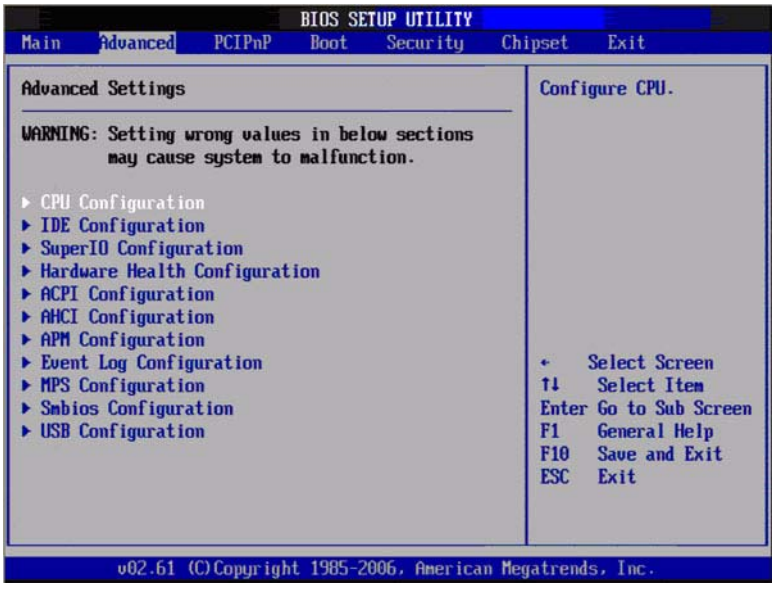


Figure 3.3 Advanced BIOS features setup screen

3.3.1 CPU Configuration

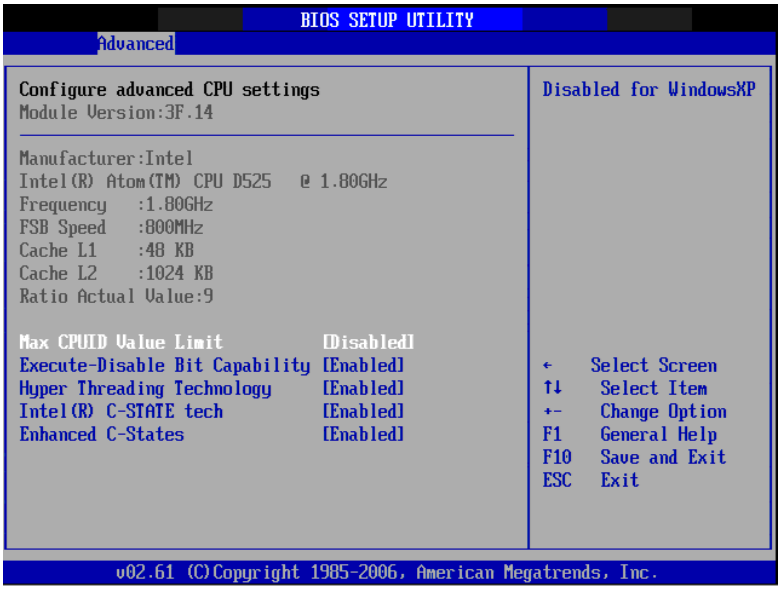


Figure 3.4 CPU Configuration Setting

Max CPUID Value Limit

This item allows you to limit CPUID maximum value.

Execute-Disable Bit Capability

This item allows you to enable or disable the No-Execution page protection technology.

Hyper Threading Technology

This item allows you to enable or disable Intel® Hyper Threading technology.

Intel® C-STATE tech

This item allows the CPU to save more power under idle mode.

Enhanced C-States

CPU idle set to enhanced C-States, disabled by Intel® C-STATE tech item.

3.3.2 IDE Configuration

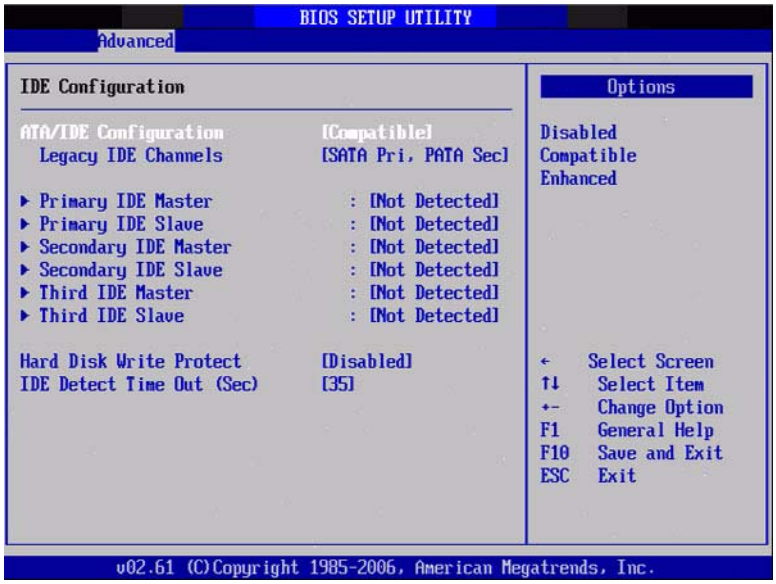


Figure 3.5 IDE Configuration

ATA/IDE Configuration

This item allows you to select Disabled / Compatible / Enhanced.

Legacy IDE Channels

When set to Enhanced mode you can select IDE or AHCI mode. When select Compatible mode you can select SATA only / SATA pri, PATA sec or PATA only.

Primary/Secondary/Third IDE Master

BIOS auto detects the presence of IDE device, and displays the status of auto detection of IDE device.

- **Type:** Select the type of SATA driver.[Not Installed][Auto][CD/DVD][ARMD]
- **LBA/Large Mode:** Enables or Disables the LBA mode.
- **Block (Multi-Sector Transfer):** Enables or disables data multi-sectors transfers.
- **PIO Mode:** Select the PIO mode.
- **DMA Mode:** Select the DMA mode.
- **S.M.A.R.T.:** Select the smart monitoring, analysis, and reporting technology.
- **32Bit Data Transfer:** Enables or disables 32-bit data transfer.

Hard Disk Write Protect

Disable/Enable device write protection. This will be effective only if device is accessed through BIOS.

IDE Detect Time Out (Sec)

This item allows you to select the time out value for detecting ATA/ATAPI device(s).

3.3.3 Super I/O Configuration

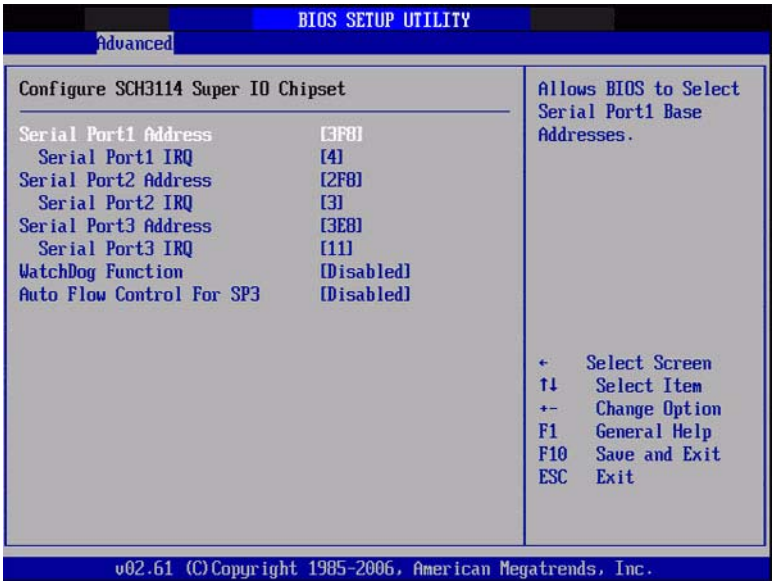


Figure 3.6 Super I/O Configuration

Serial Port1 / Port2 / Port3 address

This item allows you to select base addresses of serial port1 ~ port3.

Serial Port1 / Port2 / Port3 IRQ

This item allows you to select IRQ of serial port1 ~ port3.

WatchDog function

This item allows you to enable WatchDog function by minutes or seconds.

Auto Flow Control For SP3

This item allows you to enable or disable auto flow control function.

3.3.4 Hardware Health Configuration

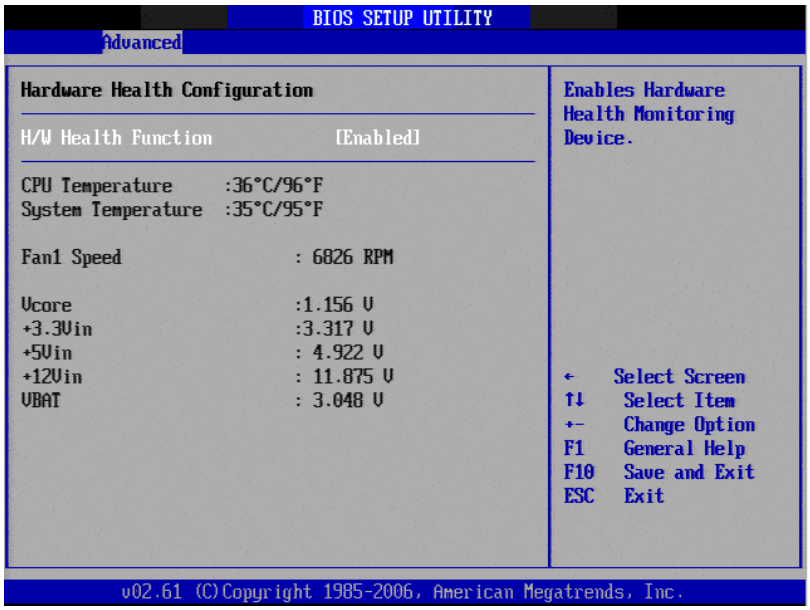


Figure 3.7 Hardware health configuration

H/W Health Function

This item allows you to control H/W monitor display.

Fan1 Speed show

Display Fan1 Speed RPM.

Temperature & Voltage show

CPU/System Temperature

Vcore / +3.3Vin / +5Vin / +12Vin / VBAT

3.3.5 ACPI Settings

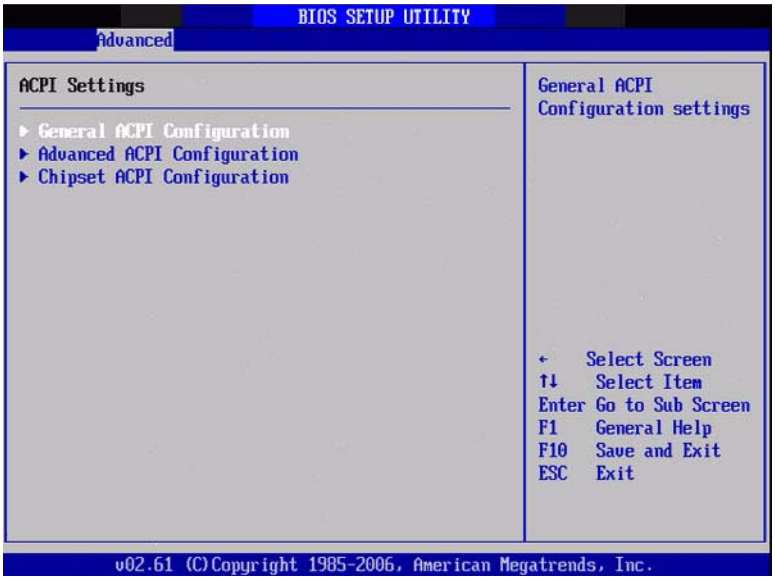


Figure 3.8 ACPI Settings

3.3.5.1 General ACPI Configuration

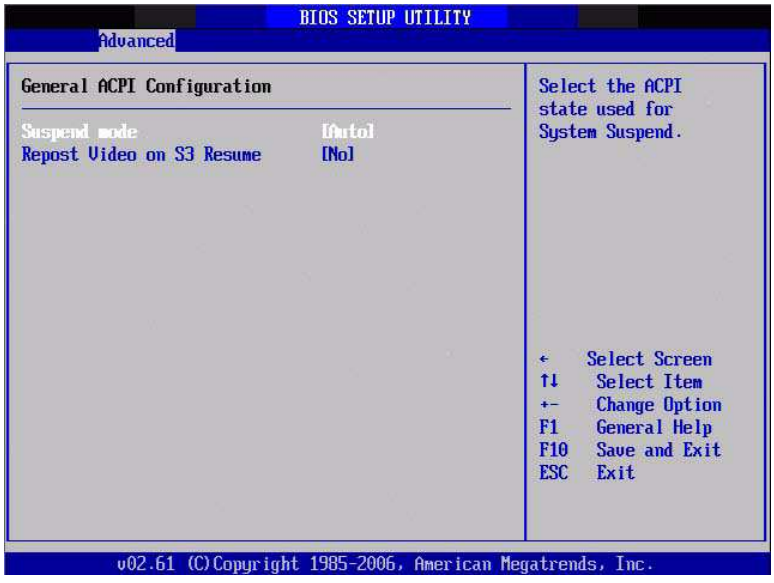


Figure 3.9 General ACPI Configuration

Suspend mode

Select the ACPI state used for system suspend.

Report Video on S3 Resume

This item allows you to invoke VA BIOS POST on S3/STR resume.

3.3.5.2 Advanced ACPI Configuration

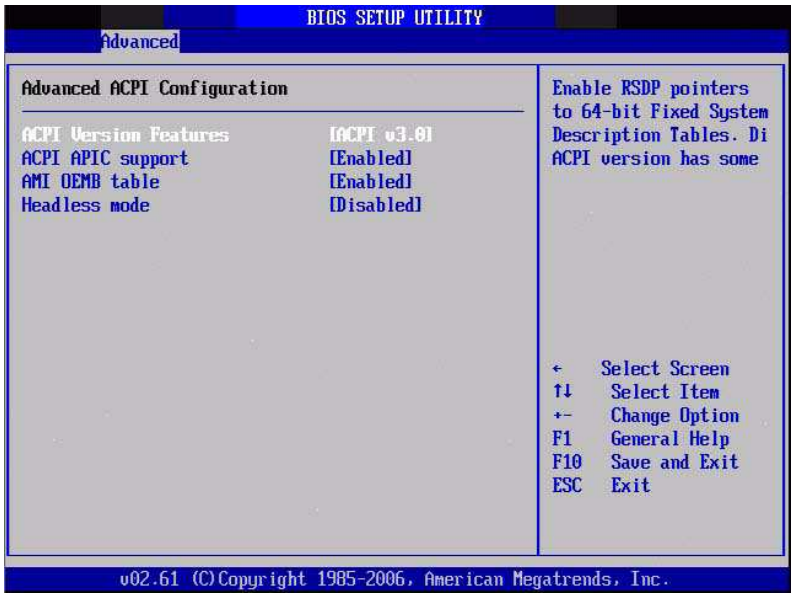


Figure 3.10 Advanced ACPI Configuration

ACPI Version Features

This item allows you to enable RSDP pointers to 64-bit fixed system description tables.

ACPI APIC support

Include APIC table pointer to RSDT pointer list.

AMI OEMB table

Include OEMB table pointer to R(x)SDT pointer lists.

Headless mode

Enable / Disable Headless operation mode through ACPI.

3.3.5.3 Chipset ACPI Configuration

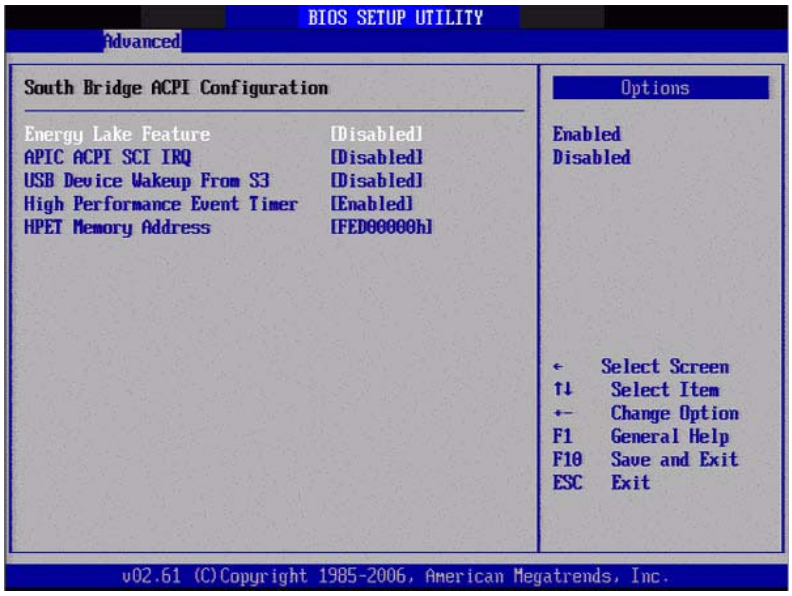


Figure 3.11 Chipset ACPI Configuration

Energy Lake Feature

Allows you to configure Intel's Energy Lake power management technology.

APIC ACPI SCI IRQ

Enable/Disable APIC ACPI SCI IRQ.

USB Device Wakeup From S3/S4

Enable/Disable USB Device Wakeup from S3/S4.

High Performance Event Timer

Enable/Disable High performance Event timer.

3.3.6 AHCI Configuration

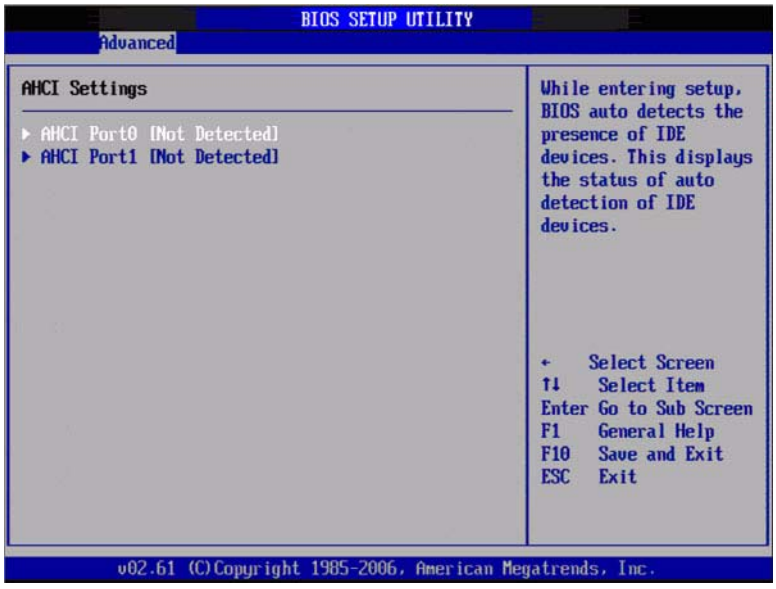


Figure 3.12 AHCI Configuration

AHCI Ports0/Port1

While entering setup, BIOS auto detects the presence of IDE devices. This displays the status of auto detection of IDE device.

3.3.7 APM Configuration

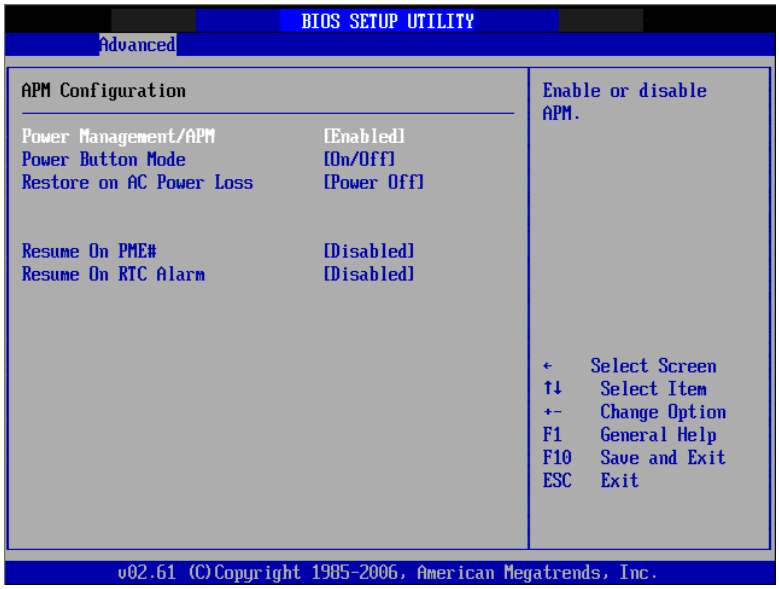


Figure 3.13 APM Configuration

Power Management/APM

Enable or disable APM.

Power Button Mode

Power on, off, or enter suspend mode when the power button is pressed. The following options are also available.

Restore on AC power Loss

Use this to set up the system response after a power failure. The "Off" setting keeps the system powered off after power failure, the "On" setting boots up the system after failure, and the "Last State" returns the system to the status just before power failure.

Resume On PME#

Enable / Disable PME to generate a wake event.

Resume On RTC Alarm

Enable / Disable RTC to generate a wake event.

3.3.8 Event Log Configuration

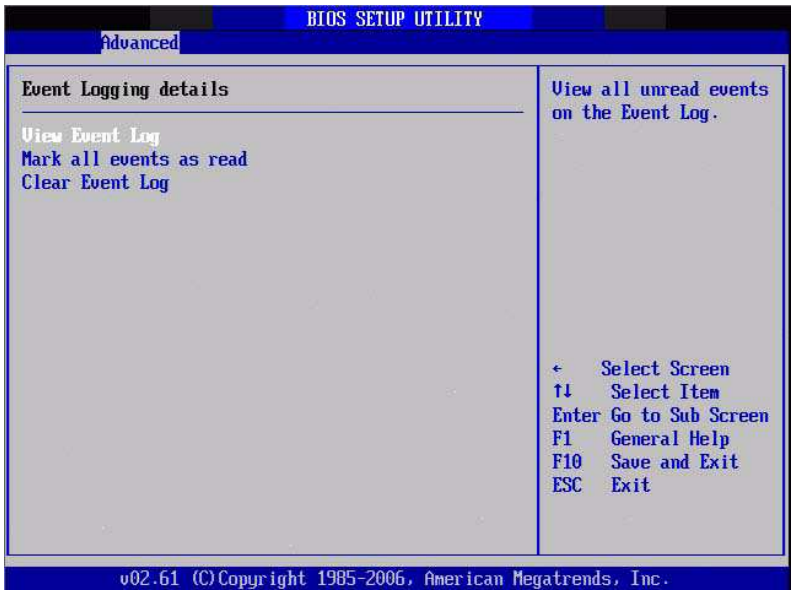


Figure 3.14 Event Log Configuration

View Event Log

View all unread events on the event Log.

Mark all events as read

Mark all unread events as read.

Clear Event Log

Discard all events in the event Log.

3.3.9 MPS Configuration

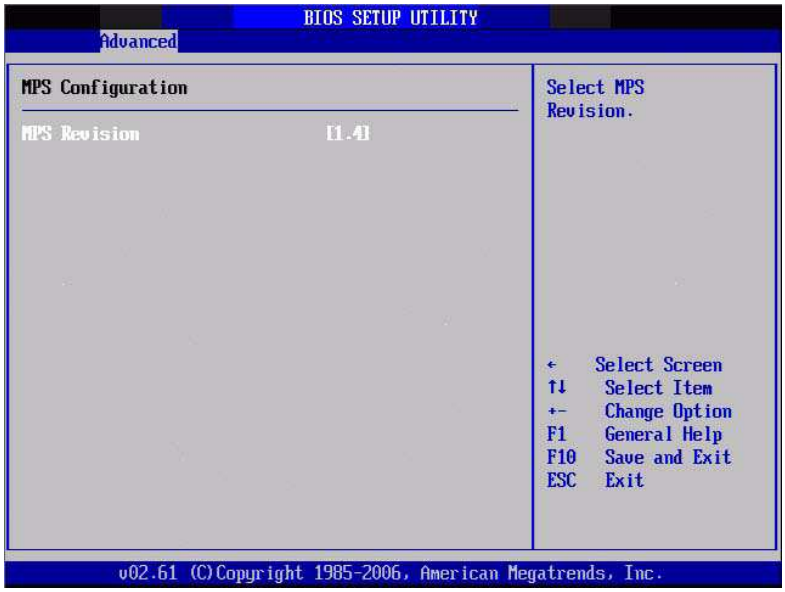


Figure 3.15 MPS Configuration

MPS Revision

This item allows you to select MPS reversion.

3.3.10 Smbios Configuration

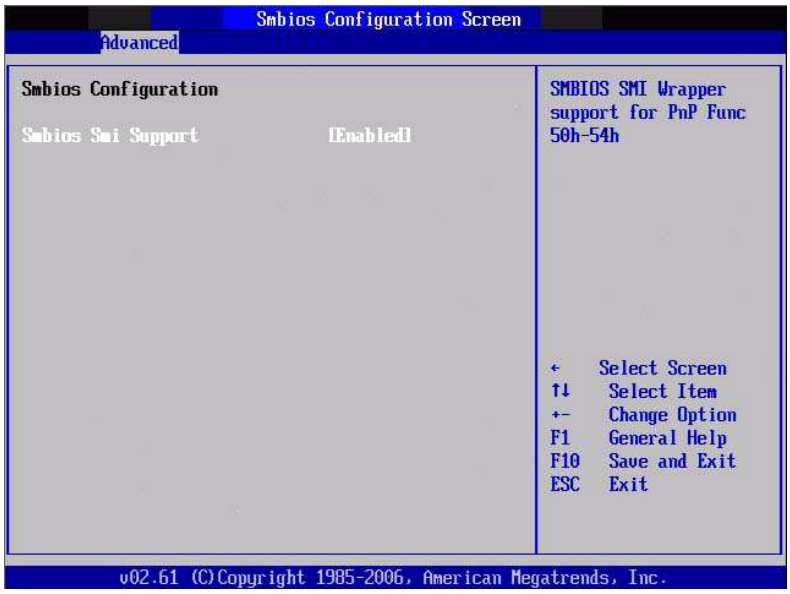


Figure 3.16 Smbios Configuration

Smbios Smi Support

SMBIOS SMI wrapper support for PnP function 50h-54h.

3.3.11 USB Configuration

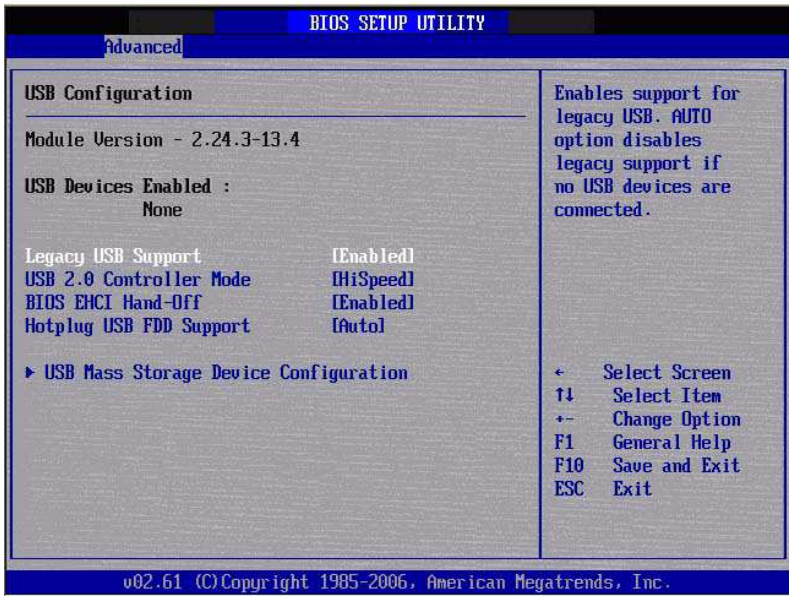


Figure 3.17 USB Configuration

Legacy USB Support

Enables support for legacy USB. Auto option disables legacy support if no USB devices are connected.

USB 2.0 Controller Mode

This item allows you to select HiSpeed(480Mbps) or FullSpeed (12Mpbs).

BIOS EHCI Hand-Off

This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should claim by EHCI driver.

Hotplug USB FDD Support

A dummy FDD device is created that will be associated with the hotplugged FDD later. Auto option creates this dummy device only if there is no USB FDD present.

3.3.11.1 USB Mass Storage Device Configuration

Figure 3.18 USB Mass storage Device Configuration

USB Mass Storage Reset Delay

Number of sends POST wait for the USB mass storage device after start unit command.

Emulation Type

If Auto, USB devices less than 530MB will be emulated as Floppy and remaining as hard drive. Force FDD option can be used to force a FDD formatted drive to boot as FDD (Ex. ZIP drive).

3.4 Advanced PCI/PnP Settings

Select the PCI/PnP tab from the PCM-3363 setup screen to enter the Plug and Play BIOS Setup screen. You can display a Plug and Play BIOS Setup option by highlighting it using the <Arrow> keys. All Plug and Play BIOS Setup options are described in this section. The Plug and Play BIOS Setup screen is shown below.

Figure 3.19 PCI/PNP Setup (top)

Clear NVRAM

Set this value to force the BIOS to clear the Non-Volatile Random Access Memory (NVRAM).The Optimal and Fail-Safe default setting is No.

Plug & Play O/S

When set to No, BIOS configures all the device in the system. When set to Yes and if you install a Plug and Play operating system, the operating system configures the Plug and Play device not required for boot.

PCI Latency Timer

Value in units of PCI clocks for PCI device latency timer register.

Allocate IRQ to PCI VGA

When set to Yes will assign IRQ to PCI VGA card if card requests IRQ. When set to No will not assign IRQ to PCI VGA card even if card requests an IRQ.

Palette Snooping

This item is designed to solve problems caused by some non-standard VGA cards.

PCI IDE BusMaster

When set to enabled BIOS uses PCI busmastering for reading/writing to IDE drives.

OffBoard PCI/ISA IDE Card

Some PCI IDE cards may require this to be set to the PCI slot number that is holding the card. When set to Auto, will work for most PCI IDE cards.

IRQ3/4/5/7/9/10/11

This item allows you respectively assign an interrupt type for IRQ-3, 4, 5, 7, 9, 10, 11.

DMA Channel0/1/3/5/6/7

When set to Available will specify that DMA is available to be used by PCI/PnP devices. When set to Reserved will specify DMA will be Reserved for use by legacy ISA devices.

Reserved Memory Size

This item allows you to set memory block reserve size for legacy ISA devices.

3.5 Boot Settings

Figure 3.20 Boot Setup Utility

3.5.1 Boot settings Configuration

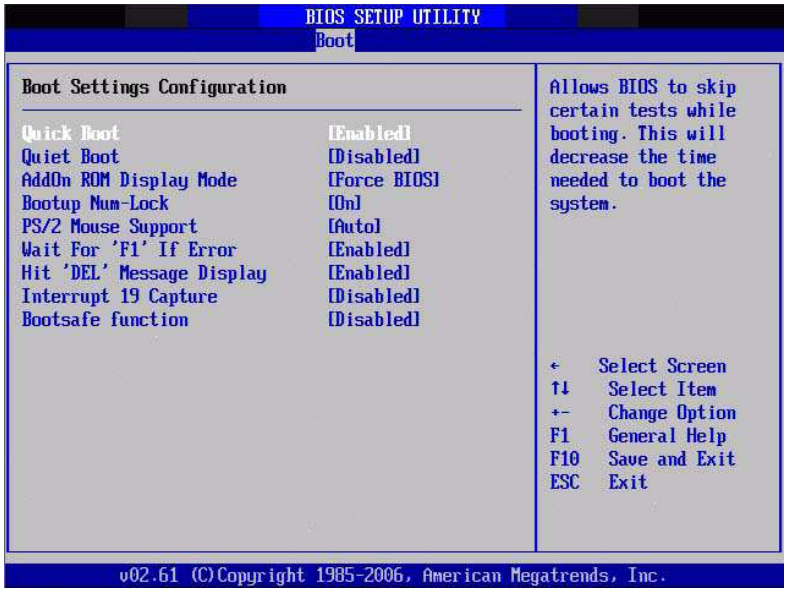


Figure 3.21 Boot Setting Configuration

Quick Boot

This item allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.

Quiet Boot

If this option is set to Disabled, the BIOS displays normal POST messages. If Enabled, an OEM Logo is shown instead of POST messages.

AddOn ROM Display Mode

Set display mode for option ROM.

Bootup Num-Lock

Select the Power-on state for Numlock.

PS/2 Mouse Support

Select support for PS/2 Mouse.

Wait For 'F1' If Error

Wait for the F1 key to be pressed if an error occurs.

Hit 'DEL' Message Display

Displays "Press DEL to run Setup" in POST.

Interrupt 19 Capture

This item allows option ROMs to trap interrupt 19.

Bootsafe function

This item allows you to enable or disable bootsafe function.

3.6 Security Setup

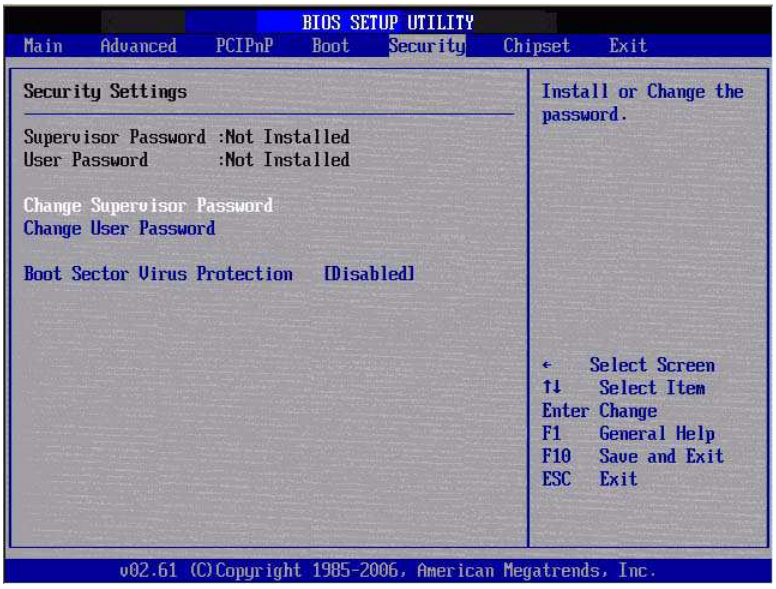


Figure 3.22 Password Configuration

Select Security Setup from the PCM-3363 Setup main BIOS setup menu. All Security Setup options, such as password protection and virus protection are described in this section. To access the sub menu for the following items, select the item and press <Enter>:

Change Supervisor / User Password

Boot sector Virus protection: The boot sector virus protection will warn if any program tries to write to the boot sector.

3.7 Advanced Chipset Settings

Figure 3.23 Advanced Chipset Settings

3.7.1 North Bridge Chipset Configuration

Figure 3.24 North Bridge Configuration

DRAM Frequency

This item allows you to manually changed DRAM frequency.

Configure DRAM Timing by SPD

This item allows you to enable or disable detect by DRAM SPD.

Initate Graphic Aadapter

This item allows you to select which graphics controller to use as the primary boot device.

Internal Graphics Mode Select:

Select the amount of system memory used by the Internal graphics device.

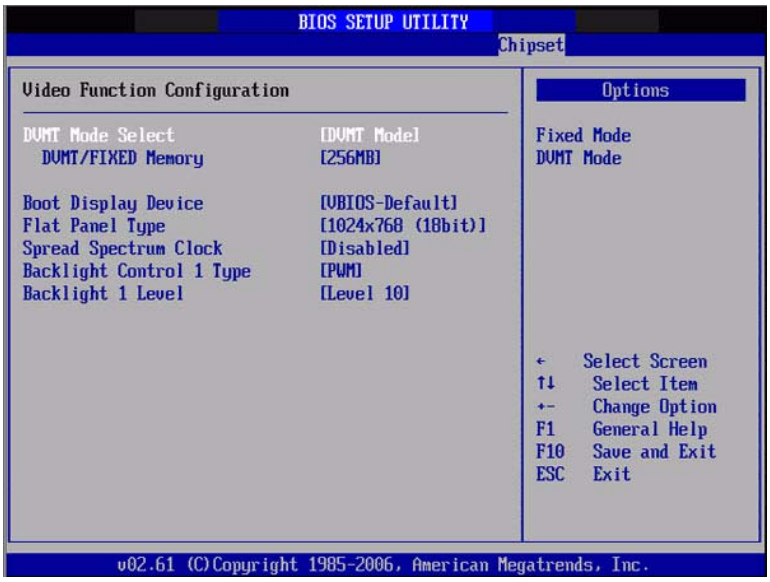


Figure 3.25 Video function configuration

DVMT Mode Select

Displays the active system memory mode.

DVMT/FIXED Memory

Specify the amount of DVMT / FIXED system memory to allocate for video memory.

Boot Display Device

Select boot display device at post stage.

Flat Panel Type

This item allows you to select which panel resolution you want.

Spread Spectrum Clock

This item allows you to enable or disable spread spectrum clock.

Backlight Control 1 Type

This item allows you to select backlight control type.

Backlight 1 Level

This item allows you to select backlight level.

3.7.2 South Bridge Chipset Configuration

Figure 3.26 South Bridge Configuration

USB Functions

Three choices: disabled, 2 USB Ports, or 4 USB Ports.

USB 2.0 Controller

Enables or disables the USB 2.0 controller.

Intel 82567V controller

Enables or disables the intel LAN controller.

Boot Rom

Enables or disables internal LAN boot.

Wake Up From S5

Enables or disables LAN1 wake up from S5 function.

HDA Controller

Enables or disables the HDA controller.

SMBUS Controller

Enables or disables the SMBUS controller.

SLP_S4# Min. Assertion Width

This item sets the minimum assertion width of the SLP-S4# signal to guarantee the DRAM has been safely power-cycled.

3.8 Exit Option

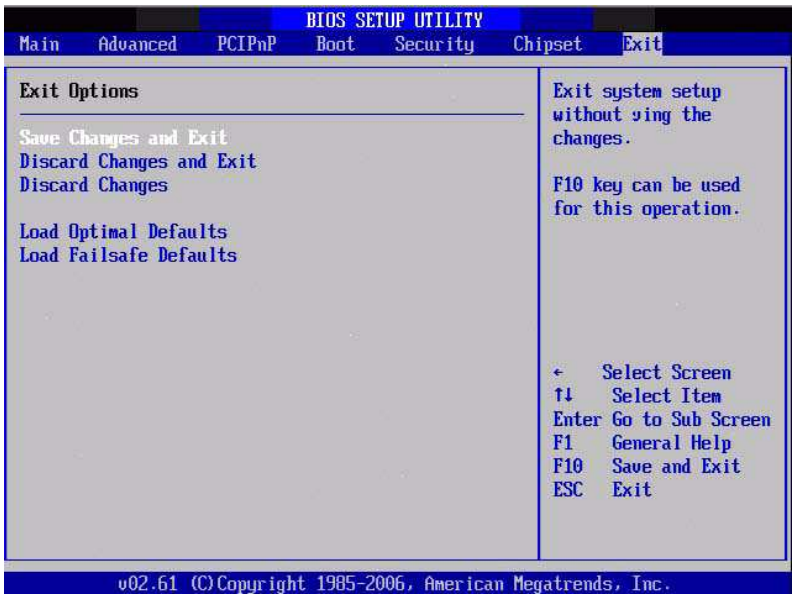


Figure 3.27 Exit Option

3.8.1 Save Changes and Exit

When you have completed system configuration, select this option to save your changes, exit BIOS setup and reboot the computer so the new system configuration parameters can take effect.

1. Select Exit Saving Changes from the Exit menu and press <Enter>.
   The following message appears: Save Configuration Changes and Exit Now? [Ok] [Cancel]
2. Select Ok or cancel.

3.8.2 Discard Changes and Exit

Select this option to quit Setup without making any permanent changes to the system configuration.

1. Select Exit Discarding Changes from the Exit menu and press <Enter>. The following message appears: Discard Changes and Exit Setup Now? [Ok] [Cancel]
2. Select Ok to discard changes and exit. Discard Changes
3. Select Discard Changes from the Exit menu and press <Enter>.

3.8.3 Load Optimal Defaults

The PCM-3363 automatically configures all setup items to optimal settings when you select this option. Optimal Defaults are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Optimal Defaults if your computer is experiencing system configuration problems. Select Load Optimal Defaults from the Exit menu and press <Enter>.

3.8.4 Load Fail-Safe Defaults

The PCM-3363 automatically configures all setup options to fail-safe settings when you select this option. Fail-Safe Defaults are designed for maximum system stability, but not maximum performance. Select Fail-Safe Defaults if your computer is experiencing system configuration problems.

1. Select Load Fail-Safe Defaults from the Exit menu and press <Enter>. The following message appears: Load Fail-Safe Defaults? [OK] [Cancel]
2. Select OK to load Fail-Safe defaults.

Chapter 4

Software Introduction & Installation

4.1 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.

4.2 Driver Installation

4.2.1 Windows® XP professional

To install the drivers, insert the driver DVD into DVD-ROM, select the drivers that need to be installed, then launch setup file under each function folder and follow Driver Setup instructions to complete the process.

4.2.2 Other OS

To install the drivers for other Windows® OS (Window 7), please browse the DVD to run the setup file under the appropriate OS folder(s).

4.3 Value-Added Software Services

4.3.1 SUSI Introduction

To make hardware easier and more 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, I^2C, SMBus, GPIO, and VGA control. Each category of API in SUSI is briefly described below.

4.3.2 Software APIs

PCM-3363 supports software APIs including GPIO, I^{2}C, backlight on/off, Brightness control, watchdog, Hardware Monitor, and Power Saving.

4.3.2.1 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.

4.3.2.2 The I^{2}C API

I^{2}C 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 I^{2}C protocol has been taken care of by SUSI. Instead of asking application programmers to figure out the strict timing requirements in the I^{2}C protocol, the I^{2}C API in SUSI can be used to control I^{2}C 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.

4.3.2.3 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.

4.3.2.4 The SMBus API

The System Management Bus (SMBus) is a two-wire interface defined by Intel® Corporation in 1995. It is based on the same principles of operation of I^{2}C and is used in personal computers and servers for low-speed system management communications. Nowadays, it can be seen in many types of embedded systems. As with other API in SUSI, the SMBus API is available on many platforms including Windows XP and Windows CE.

4.3.2.5 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.

4.3.2.6 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 time-out value if the hardware requires customized time-out values.

4.3.2.7 The Hardware Monitor API

The hardware monitor (abbreviated as HWM) is a system health supervision capability achieved by placing certain I/O chips along with sensors for inspecting certain condition indexes, such as fan speed, temperature and voltage, etc.

However, due to the inaccuracy among many commercially available hardware monitoring chips, Advantech has developed a unique scheme for hardware monitoring - achieved by using a dedicated micro-processor with algorithms specifically designed for providing accurate, real-time and reliable data; helping protect your system in a more reliable manner.

4.3.2.8 The Power Saving API

1. CPU Speed
   - Make use of Intel® SpeedStep technology to reduce power consumption. The system will automatically adjust the CPU Speed depending on system loading.
2. System Throttling
   - Refers to a series of methods for reducing power consumption in computers by lowering the clock frequency. APIs allow the user to lower the clock from 87.5% to 12.5%.

4.3.3 SUSI Utilities

PCM-3363 supports software Utility including Embedded Security ID, Monitoring utility, eSOS.

4.3.3.1 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.

4.3.3.2 Monitoring utility

The Monitoring utility allows the customer to monitor system health, including voltage, CPU and system temperature and fan speed. These items are important to a device; if critical errors happen and are not solved immediately, permanent damage may be caused.

4.3.3.3 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 for remote connection via Telnet server and FTP server, allowing the administrator to rescue the system.

Note! *eSOS Utility support on PCM-3363 requires BIOS modification.*

4.3.4 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.

4.3.4.1 Windows XP

In windows XP, you can install the library, drivers and demo programs onto the platform easily using the installation tool--The 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	■ Susi.lib Library for developing the applications on Windows XP. ■ Susi.dll Dynamic library for SUSI on Windows XP.
\Demo	■ SusiDemo.EXE Demo program on Windows XP. ■ 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 dialog box 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 opens. Click Next.

4.3.4.2 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, e.g. 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.

4.3.5 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.

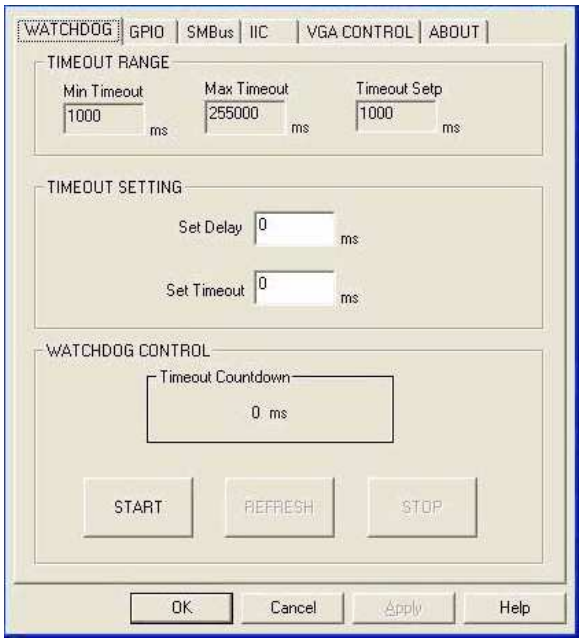
Windows Graphics Mode

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.

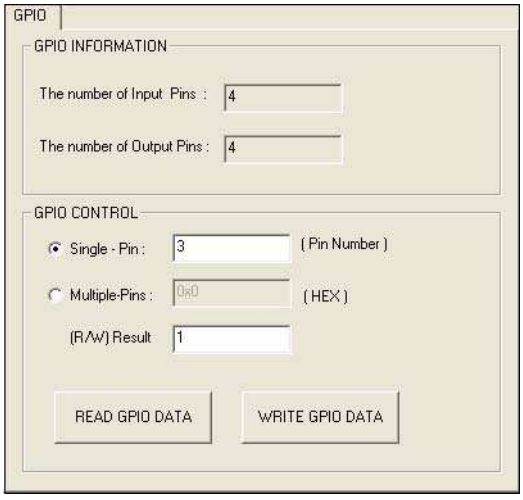
SusiDemo.exe is an executable file and it requires the shared library, Susi.dll, to demonstrate the SUSI functions. The source code of SusiDemo.exe also has two versions, i.e. Windows CE and Windows XP, and must be compiled under Microsoft Visual C++ 6.0 on Windows XP or under Microsoft Embedded Visual 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, I^2C and VGA control. The following screen shot appears when you execute SusiDemo.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. For a complete support list, please refer to Appendix A. We describe the steps to test all functions of this application.



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

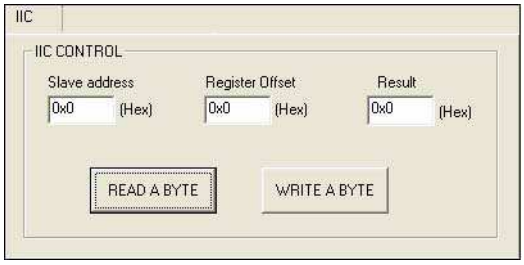
for GPIO 1, etc. For example, if you want to read pin 0, 1, and 3, the pin numbers should be ‘0x0B’.

– 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

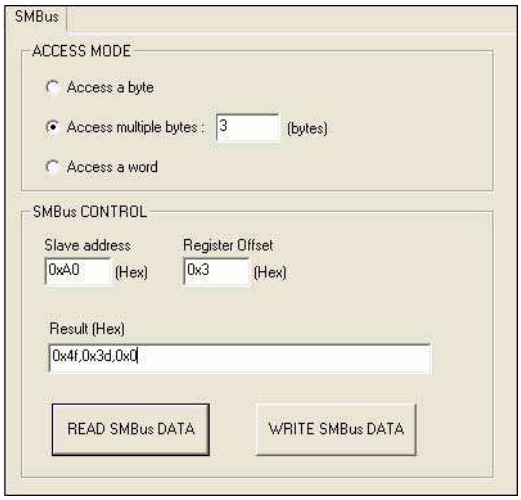


When the application is executed, you can read or write a byte of data through I2C devices. All data must be read or written in hexadecimal system.

- 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.

SMBus



When the application has executed, you can click the radio button to choose to test each access mode, i.e. Access a byte, Access multiple bytes and Access a word. All data must be read or written in hexadecimal except the numbers for radio buttons: Access multiple bytes mode must be written in decimal. You can test the functionalities of the watchdog as follows:

- Read a byte
  - Click the radio button- Access a byte.
  - Key in the slave device address in the Slave address field.
  - Key in the register offset in the Register Offset field.
  - Click the READ SMBus DATA button and a byte of data from the device will be shown on the Result field.

- Write a byte
  - Click the radio button- Access a byte.
  - Key in the slave device address in Slave address field.
  - Key in the register offset in Register Offset field.
  - Key the desired data in the Result field to write to the device.
  - Click the WRITE SMBus DATA button and then the data will be written to the device through SMBus.

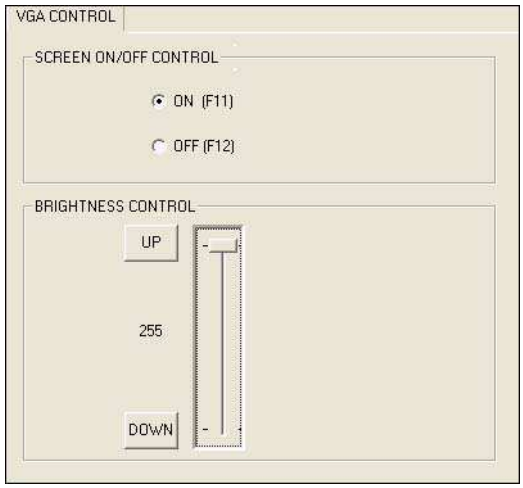
- Read a word
  - Click the radio button- Access a word.
  - Key in the slave device address in the Slave address field.
  - Key in the register offset in the Register Offset field.
  - Click the READ SMBus DATA button and then a word of data from the device will be shown on the Result field.

- Write a word
  - Click the radio button- Access a word.
  - Key in the slave device address in the Slave address field.
  - Key in the register offset in the Register Offset field.
  - Key in the desired data, such as 0x1234, in the Result field to write to the device.
  - Click the WRITE SMBus DATA button and the data will be written to the device through the SMBus.

- Read Multiple bytes
  - Click the radio button- Access multiple bytes.
  - Key in the slave device address in the Slave address field.
  - Key in the register offset in the Register Offset field.
  - Key in the desired number of bytes, such as 3, in the right side field of radio button- Access multiple bytes. The number must be written in decimal.
  - Click the READ SMBus DATA button and then all data from the device will be divided from each other by commas and be shown in the Result field.

- Write Multiple bytes
  - Click the radio button- Access multiple bytes.
  - Key in the slave device address in the Slave address field.
  - Key in the register offset in the Register Offset field.
  - Key in the desired number of bytes, such as 3, in the right side field of the radio button- Access multiple bytes. The number must be written in decimal.
  - Key in all the desired data in the Result field in hexadecimal format, divided by commas, for example, 0x50,0x60,0x7A.
  - Click the WRITE SMBus DATA button and all of the data will be written to the device through the SMBus.

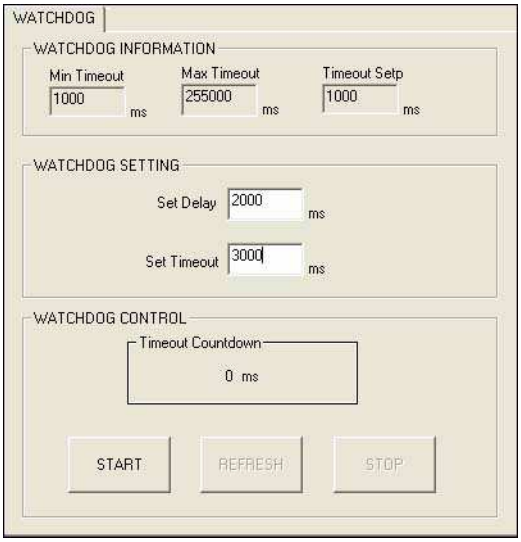
Display Control



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.

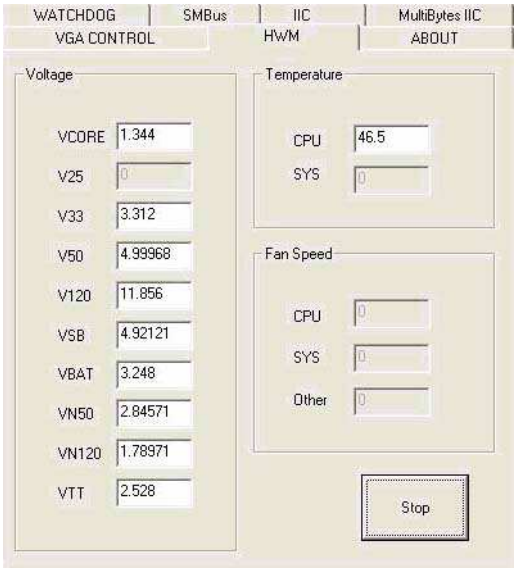
Watchdog



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 has 255000 max timeout, 1000 min timeout, and 1000 timeout steps. You can test the functionality of the watchdog as follows:

- Set the timeout value to 3000 (3 sec.) in the SET TIMEOUT field and set the delay value to 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, just click the STOP button.

Hardware Monitor



When the Monitor application is executed by clicking the button, hardware monitoring data values will be displayed. If certain data values are not supported by the platform, the correspondent data field will be grayed-out with a value of 0.

For More detail PCM-3363 software API user manual, please contact your dealer or Advantech AE. We also include these manuals in this DVD.

Appendix A

Pin Assignments

This appendix contains information of a detailed or specialized nature.
Sections include:

- Jumper and Connector Tables

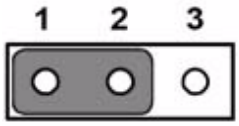
A.1 Jumper and Connector Tables

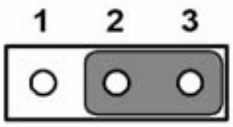
J1	AT/ATX Power Setting
Part Number	1653002101
Footprint	HD_2x1P_79_D
Description	PIN HEADER 2*1P 180D(M)SQUARE 2.0mm DIP W/O Pb
Setting	Function
NC	ATX Power
(1-2)	AT Power

J2	RS485/422 Setting
Part Number	1653003101
Footprint	HD_3x1P_79_D
Description	PIN HEADER 3*1P 180D(M) 2.0mm DIP SQUARE W/O Pb
Setting	Function
(1-2)	RS485
(2-3)	RS422

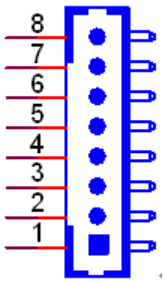
J3	PCI VIO Setting
Part Number	1653003101
Footprint	HD_3x1P_79_D
Description	PIN HEADER 3*1P 180D(M) 2.0mm DIP SQUARE W/O Pb
Setting	Function
(1-2)	+5 V
(2-3)	+3.3 V

J4	LCD Power
Part Number	1653003101
Footprint	HD_3x1P_79_D
Description	PIN HEADER 3*1P 180D(M) 2.0mm DIP SQUARE W/O Pb
Setting	Function
(1-2)	+5 V
(2-3)	+3.3 V

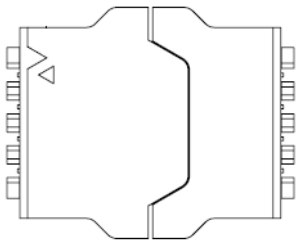




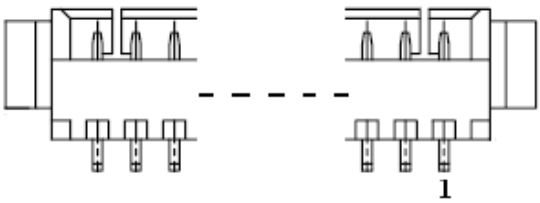
CN1	Power Input		
Part Number	1655308120		
Footprint	WHL8H-2M		
Description	Wafer Box 2.0mm 8P 90D	Male W/Lock	2
Pin	Pin Name		
1	+5 V		
2	+5 V		
3	+5 V		
4	GND		
5	GND		
6	GND		
7	GND		
8	+12 V		



CN2	BIOS Socket
Part Number	1651000682
Footprint	SOCKET_8P_ACA-SPI-004-K01
Description	IC SKT 8P SMD WO/Pb C ACA-SPI-004-K01
Pin	Pin Name
1	CE#
2	SO
3	WP#
4	GND
5	SI
6	SCK
7	HOLD#
8	+3.3

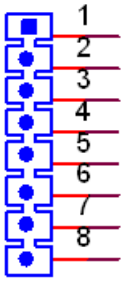


CN3	VGA
Part Number	1655912120
Footprint	SP-12SMH
Description	Wafer Box 1.25mm 12P 90D(M) SMD 85204-12001
Pin	Pin Name
1	GND
2	RED
3	GREEN
4	BLUE
5	GND
6	NC
7	DDAT
8	DCLK
9	GND
10	HSYNC
11	VSYNC
12	GND



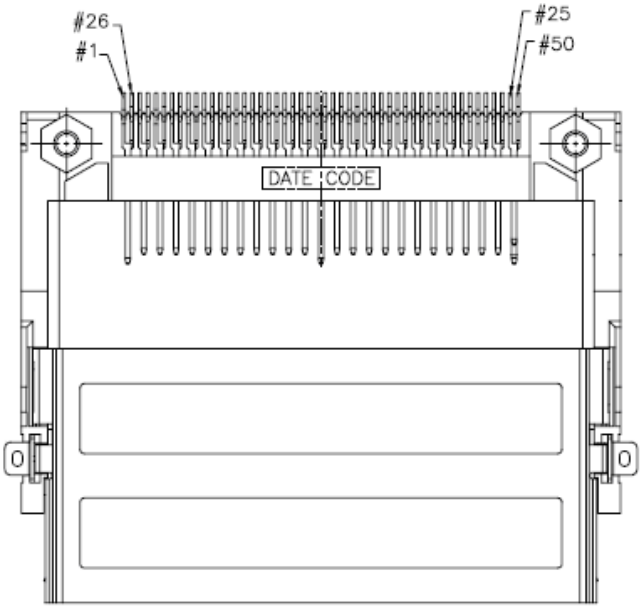
Matching Cable: 1700000898

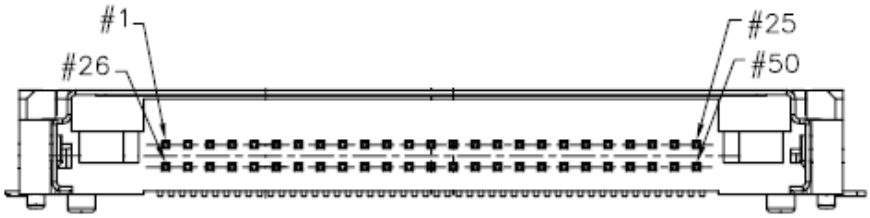
CN4	Front Panel	
Part Number	1653008101	
Footprint	JH8X1V-2M	
Description	PIN HEADER 8*1P 180D(M) SQUARE 2.0mm	1
Pin	Pin Name	
1	Power Button Pin1	
2	Power Button Pin2	
3	Reset Button	
4	Reset Button	
5	Power LED+	
6	Power LED-	
7	HDD LED+	
8	HDD LED-	



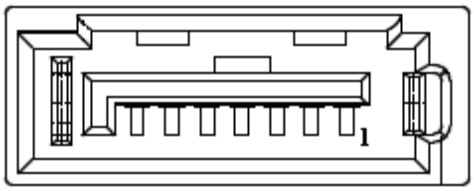
CN5	CF
Part Number	1653002919
Footprint	CF_50P_CFCMD-35T15W100
Description	CF Type2 Conn.50P 90D(M) SMD WO/Pb CFCMD-35T15W1
Pin	Pin Name
1	GND
2	D03
3	D04
4	D05
5	D06
6	D07
7	CS0#
8	GND
9	GND
10	GND
11	GND
12	GND
13	+5V
14	GND
15	GND
16	GND
17	GND
18	A02

19	A01
20	A00
21	D00
22	D01
23	D02
24	NC
25	CD2#
26	CD1#
27	D11
28	D12
29	D13
30	D14
31	D15
32	CS1#
33	VS1#
34	IORD#
35	IOWR#
36	WE#
37	IREQ
38	+5V
39	CSEL#
40	VS2#
41	RESET
42	IORDY
43	INPACK#
44	REG#
45	DASP#
46	PDIAG#
47	D08
48	D09
49	D10
50	GND

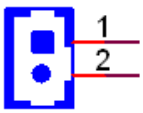




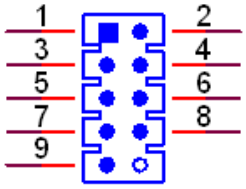
CN6	SATA
Part Number	1654004118
Footprint	SATA_7P_50_WATA-07DPLH4U
Description	Serial ATA Con 7P 90D(M) SMD 1.27mm
Pin	Pin Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND



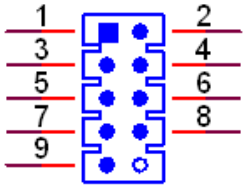
CN7	SATA Power
Part Number	1655302020
Footprint	WF_2P_79_BOX_R1_D
Description	WAFER BOX 2P 180D(M) 2.0mm W/Lock
Pin	Pin Name
1	+5V
2	GND



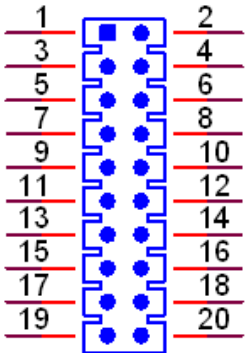
CN8	Internal USB
Part Number	1655002182
Footprint	WF_5x2P_79_BOX_N10_D
Description	Wafer box conn. DIP 2*5P 180D(M) 2.0mm NO.10P
Pin	Pin Name
1	+5V
2	+5V
3	A_D-
4	B_D-
5	A_D+
6	B_D+
7	GND
8	GND
9	GND



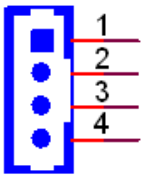
CN9	Internal USB
Part Number	1655002182
Footprint	WF_5x2P_79_BOX_N10_D
Description	Wafer box conn. DIP 2*5P 180D(M) 2.0mm NO.10P
Pin	Pin Name
1	+5V
2	+5V
3	A_D-
4	B_D-
5	A_D+
6	B_D+
7	GND
8	GND
9	GND



CN10	COM1/COM2
Part Number	1655003790
Footprint	WF_10x2P_79_BOX_D
Description	WAFER BOX 2*10P 2mm 180D(M) DIP 24W2140-20S10-01
Pin	Pin Name
1	DCD1#
2	DSR1#
3	RXD1
4	RTS1#
5	TXD1
6	CTS1#
7	DTR1#
8	RI1#
9	GND
10	GND
11	DCD2#
12	DSR2#
13	RXD2
14	RTS2#
15	TXD2
16	CTS2#
17	DTR2#
18	RI2#
19	GND
20	GND



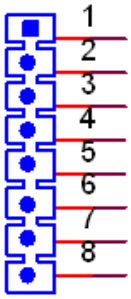
CN12	RS422/485
Part Number	1655304120
Footprint	WHL4H-2M_A
Description	WAFER BOX 2.0mm 4P 90D(M) DIP W/LOCK
Pin	Pin Name
1	422RX-
2	422RX+
3	422/485TX+
4	422/485TX-



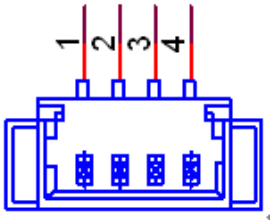
CN13	PS/2
Part Number	1655306020
Footprint	WHL6V-2M
Description	WAFER BOX 2.0mm 6P 180D(M) W/LOCK
Pin	Pin Name
1	KBCLK
2	KBDAT
3	MSCLK
4	GND
5	+5V
6	MSDAT

Matching Cable: 1703060053 1703060191 1700060202

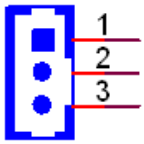
CN14	HD Audio	
Part Number	1653008101	
Footprint	JH8X1V-2M	
Description	PIN HEADER 8*1P 180D(M) SQUARE 2.0mm	1
Pin	Pin Name	
1	+5V	
2	GND	
3	BITCLK	
4	SYNC	
5	RST#	
6	SDIN	
7	SDOUT	
8	+V12	



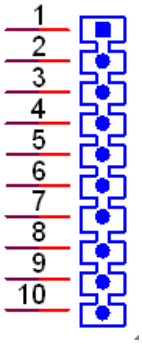
CN15	SMBus (I^2C)
Part Number	1655904020
Footprint	FPC4V-125M
Description	Wafer SMT 1.25mmS/T type 4P 180D(M) 85205-04001
Pin	Pin Name
1	GND
2	SMB_DAT
3	SMB_CLK
4	+5 V



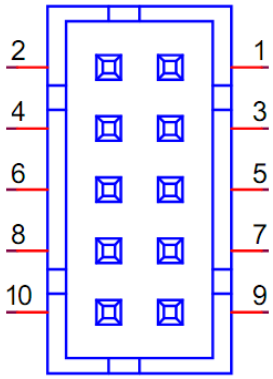
CN16	CPU FAN (+5V)
Part Number	1655303020
Footprint	WHL3V-2M
Description	WAFER BOX 2.0mm 3P 180D w/LOCK
Pin	Pin Name
1	Speed
2	+5V
3	GND



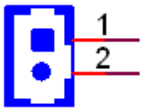
CN17	GPIO
Part Number	1653010102
Footprint	JH10X1V-2M
Description	PIN HEADER 10*1P 180D P=2.0mm 1
Pin	Pin Name
1	+5V
2	GPIO0
3	GPIO1
4	GPIO2
5	GPIO3
6	GPIO4
7	GPIO5
8	GPIO6
9	GPIO7
10	GND



CN18	Gigabit Ethernet
Part Number	1655000197
Footprint	WF_5x2P_79_BOX_D_P1R
Description	Wafer 2.00mm 2*5P 180D(M) DIP W/LOCK WO/Pb
Pin	Pin Name
1	GND
2	GND
3	BI_DD+(GHz)
4	BI_DD-(GHz)
5	BI_DC+(GHz)
6	BI_DC-(GHz)
7	RX+(10/100),BI_DB+(GHz)
8	RX-(10/100),BI_DB-(GHz)
9	TX+(10/100),BI_DA+(GHz)
10	TX-(10/100),BI_DA-(GHz)



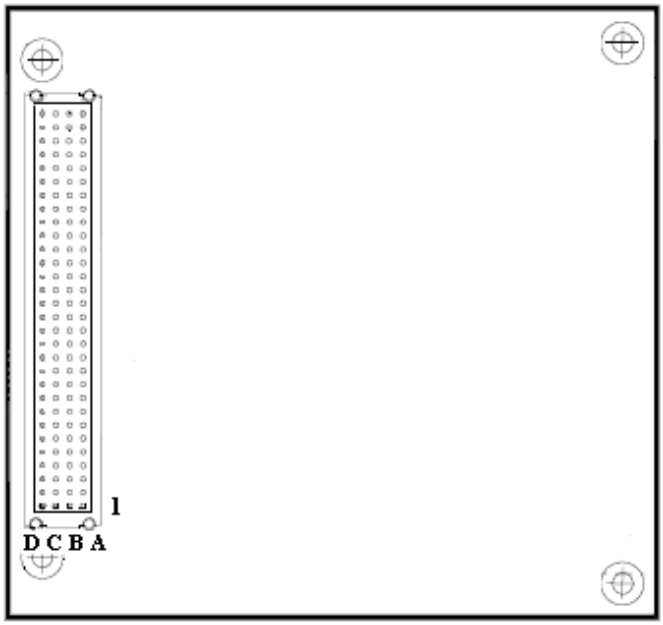
CN21	Buzzer
Part Number	1655902032
Footprint	WHL2V-125
Description	WAFER 2P 180D(M) 1.25mm DIP 53047-0210
Pin	Pin Name
1	Buzzer+
2	Buzzer-



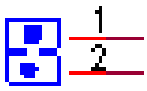
CN22	PCI-104
Part Number	00A0000020 1653130428
Footprint	PC104-PCI-PLUS
Description	PCI-104
Pin	Pin Name
PA1	GND
PA2	VI/O (+5V or +3.3V)
PA3	AD05
PA4	C/BE0#
PA5	GND
PA6	AD11
PA7	AD14
PA8	+3.3V
PA9	SERR#
PA10	GND
PA11	STOP#
PA12	+3.3V
PA13	FRAME#
PA14	GND
PA15	AD18
PA16	AD21
PA17	+3.3V
PA18	IDSEL0
PA19	AD24
PA20	GND
PA21	AD29
PA22	+5V
PA23	REQ0#
PA24	GND
PA25	GNT1#
PA26	+5V
PA27	CLK2
PA28	GND
PA29	+12V
PA30	-12V
PB1	NC
PB2	AD02
PB3	GND
PB4	AD07
PB5	AD09
PB6	VI/O (+5V or +3.3V)
PB7	AD13
PB8	C/BE1#
PB9	GND
PB10	PERR#
PB11	+3.3V
PB12	TRDY#

PB13	GND
PB14	AD16
PB15	+3.3V
PB16	AD20
PB17	AD23
PB18	GND
PB19	C/BE3#
PB20	AD26
PB21	+5V
PB22	AD30
PB23	GND
PB24	REQ2#
PB25	VI/O (+5V or +3.3V)
PB26	CLK0
PB27	+5V
PB28	INTD#
PB29	INTA#
PB30	REQ3#
PC1	+5V
PC2	AD01
PC3	AD04
PC4	GND
PC5	AD08
PC6	AD10
PC7	GND
PC8	AD15
PC9	NC
PC10	+3.3V
PC11	LOCK#
PC12	GND
PC13	IRDY#
PC14	+3.3V
PC15	AD17
PC16	GND
PC17	AD22
PC18	IDSEL1
PC19	VI/O (+5V or +3.3V)
PC20	AD25
PC21	AD28
PC22	GND
PC23	REQ1#
PC24	+5V
PC25	GNT2#
PC26	GND
PC27	CLK3
PC28	+5V
PC29	INTB#
PC30	GNT3#

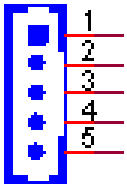
PD1	AD00
PD2	+5V
PD3	AD03
PD4	AD06
PD5	GND
PD6	M66EN
PD7	AD12
PD8	+3.3V
PD9	PAR
PD10	NC
PD11	GND
PD12	DEVSEL#
PD13	+3.3V
PD14	C/BE2#
PD15	GND
PD16	AD19
PD17	+3.3V
PD18	IDSEL2
PD19	IDSEL3
PD20	GND
PD21	AD27
PD22	AD31
PD23	VI/O (+5V or +3.3V)
PD24	GNT0#
PD25	GND
PD26	CLK1
PD27	GND
PD28	RST#
PD29	INTC#
PD30	GND



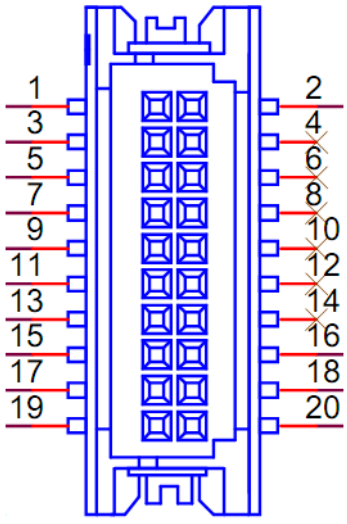
CN23	PCI-104 -12V Input
Part Number	1653002101
Footprint	HD_2x1P_79_D
Description	PIN HEADER 2*1P 180D(M)SQUARE 2.0mm DIP W/O Pb
Pin	Pin Name
1	-12V
2	GND



CN24	Inverter Power Output
Part Number	1655000453
Footprint	WHL5V-2M-24W1140
Description	WAFER BOX 2.0mm 5P 180D(M) DIP WO/Pb JIH VEI
Pin	Pin Name
1	+12 V
2	GND
3	ENABKL
4	VBR
5	+5 V



CN25	24 bits LVDS Panel
Part Number	1653910261
Footprint	SPH10X2
Description	*CONN. SMD 10*2P 180D(M)DF13-20DP-1.25V(91) HRS
Pin	Pin Name
1	GND
2	GND
3	LVDS0_D0+
4	NC
5	LVDS0_D0-
6	NC
7	LVDS0_D1+
8	NC
9	LVDS0_D1-
10	NC
11	LVDS0_D2+
12	NC
13	LVDS0_D2-
14	NC
15	LVDS0_CLK+
16	LVDS0_D3+
17	LVDS0_CLK-
18	LVDS0_D3-
19	+5 V or +3.3 V
20	+5 V or +3.3 V



Appendix B

System Assignments

This appendix contains information of a detailed nature. Sections include:

- System I/O ports
- 1st MB memory map
- DMA channel assignments
- Interrupt assignments

B.1 System I/O Ports

Table B.1: System I/O Ports	
Addr. Range (Hex)	**Device**
000-01F	DMA Controller
20h-2Dh	Interrupt Controller
50h-52h	Timer/Counter
060-06F	8042 (keyboard controller)
070-07F	Real-time clock, non-maskable interrupt (NMI) mask
080-09F	DMA page register
0A0-0BF	0A0-0BF
0C0-0DF	DMA controller
170h-177h	IDE Controller
1F0h-1F7h	IDE Controller
2F8-2FF	Serial port 2
3E8-3EF	Serial port 3
3F8-3FF	Serial port 1

B.2 1st MB Memory Map

Table B.2: 1st MB memory map	
Addr. range (Hex)	**Device**
F0000h - FFFFFh	System ROM
*CC000h - EFFFFh	Unused (reserved for Ethernet ROM)
C0000h - CBFFFh	Expansion ROM (for VGA BIOS)
B8000h - BFFFFh	CGA/EGA/VGA text
B0000h - B7FFFh	Unused
A0000h - AFFFFh	EGA/VGA graphics
00000h - 9FFFFh	Base memory

B.3 DMA channel assignments

Table B.3: DMA channel assignments	
Channel	**Function**
0	Available
1	Available (audio)
2	Floppy disk (8-bit transfer)
3	Available (parallel port)
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

* Audio DMA select 1, 3, or 5

** Parallel port DMA select 1 (LPT2) or 3 (LPT1)

B.4 Interrupt assignments

Table B.4: Interrupt assignments	
Interrupt#	**Interrupt source**
IRQ 0	Interval timer
IRQ 1	Keyboard
IRQ 2	Interrupt from controller 2 (cascade)
IRQ 3	COM2
IRQ 4	COM1
IRQ 5	Reserved
IRQ 6	Reserved
IRQ 7	Reserved
IRQ 8	RTC
IRQ 9	Reserved
IRQ 10	Reserved
IRQ 11	COM3
IRQ 12	PS/2 mouse
IRQ 13	Math coprocessor
IRQ 14	Primary IDE
IRQ 15	Secondary IDE

Appendix C

Watchdog Timer and GPIO Sample Code

C.1 Watchdog Timer sample code

1. Watchdog function:

```
;The SCH3114 Runtime base I/O address is A00h
;Setting WatchDog time value location at offset 66h
;If set value "0", it is mean disable WatchDog function.
Superio_GPIO_Port = A00h
mov dx,Superio_GPIO_Port + 66h
mov al,00h
out dx,al
.model small
.486p
.stack 256
.data
SCH3114_IO EQU A00h
.code
org 100h
.STARTup
;=====================================================
;47H
;enable WDT function bit [0]=0Ch
;=====================================================
mov dx,SCH3114_IO + 47h
mov al,0Ch
out dx,al
;=====================================================
;65H
;bit [1:0]=Reserved
;bit [6:2]Reserve=00000
;bit [7] WDT time-out Value Units Select
;Minutes=0 (default) Seconds=1
;=====================================================
mov dx,SCH3114_IO + 65h ;
mov al,080h
out dx,al
;=====================================================
;66H
;WDT timer time-out value
;bit[7:0]=0~255
;=====================================================
mov dx,SCH3114_IO + 66h
mov al,01h
out dx,al
;=====================================================
;bit[0] status bit R/W
;WD timeout occurred =1
```

```
;WD timer counting = 0
;=====================================================
mov dx,SCH3114_IO + 68h
mov al,01h
out dx,al
.exit
END
```

C.2 GPIO Code

```
;================================================================
;       Get Number of GPIO group
;       one group mean 8 gpio pins (one GPIO Chip)
; Input:
;       ax=5E87h
;       bh=00h
; output:
;       ax=5E78         ;function success, other value means function fail
;       cl= n group of gpio
;================================================================

;================================================================
;       Get GPIO Config
; Input:
;       ax=5E87h
;       bh=01h
;       cl= n ; n means which group of GPIO you want to get
; output:
;       ax=5E78         ;function success, other value means function fail
;       bl= the n group of gpio config
;          bit 0 = gpio 0 , 0 => output pin; 1 => input pin
;          bit 1 = gpio 1 , 0 => output pin; 1 => input pin
;              .....
;          bit 7 = gpio 7 , 0 => output pin; 1 => input pin
;================================================================

;================================================================
;       Set GPIO Config
; Input:
;       ax=5E87h
;       bh=02h
;       cl= n ; n means which group of GPIO you want to set
;       bl= the n group of gpio config
;          bit 0 = gpio 0 , 0 => output pin; 1 => input pin
;          bit 1 = gpio 1 , 0 => output pin; 1 => input pin
;              .....
```

```
;          bit 7 = gpio 7 , 0 => output pin; 1 => input pin
; output:
;      ax=5E78        ;function success, other value means function fail
;=================================================================

;=================================================================
;      Get GPIO status
; Input:
;      ax=5E87h
;      bh=03h
;      cl= n ; n means which group of GPIO you want to get
; output:
;      ax=5E78        ;function success, other value means function fail
;      bl= the n group of gpio status
;          bit 0 = gpio 0 , 0 => Low; 1 => High
;          bit 1 = gpio 1 , 0 => Low; 1 => High
;              .....
;          bit 7 = gpio 7 , 0 => Low; 1 => High
;=================================================================

;=================================================================
;      Set GPIO status
; Input:
;      ax=5E87h
;      bh=04h
;      cl= n ; n means which group of GPIO you want to set
;      bl= the n group of gpio status
;          bit 0 = gpio 0 , 0 => Low; 1 => High
;          bit 1 = gpio 1 , 0 => Low; 1 => High
;              .....
;          bit 7 = gpio 7 , 0 => Low; 1 => High
; output:
;      ax=5E78        ;function success, other value means function fail
;=================================================================
              mov     ax,5e87h
              mov     bh,00h
              int     15h
              cmp     ax,5e78h
              je      next_test

              lea     dx, Error_Str1
              mov     ah,09h
              int     21h
              jmp     Finish_Test
next_test:
```

```
    xor     ch,ch
    push    cx              ;save NO. of GPIO chip
;1.Set GPIO 0,2,4,6 as output, GPI 1,3,5,7 as input
    mov     ax,5e87h
    mov     bx,02aah
    int     15h
;2. Set GPIO 0,2,4,6 Output Low
    pop     cx              ;restore  NO. of GPIO chip
    push    cx              ;save NO. of GPIO chip
    mov     ax,5e87h
    mov     bx,0400h
    int     15h
;3. Check GPI 1,3,5,7 value
    pop     cx              ;restore  NO. of GPIO chip
    push    cx              ;save NO. of GPIO chip
    mov     ax,5e87h
    mov     bx,03FFh
    int     15h

    pop     cx              ;restore  NO. of GPIO chip
    push    cx              ;save NO. of GPIO chip
    dec     cx

    mov     al,Fail_lenght
    mul     cl
    lea     dx, Fail_Str
    add     dx,ax
    cmp     bl,00
    jne     test_result


;4. Set GPIO 0,2,4,6 Output differential
    pop     cx              ;restore  NO. of GPIO chip
    push    cx              ;save NO. of GPIO chip
    mov     ax,5e87h
    mov     bx,0411h
    int     15h
;5. Check GPI 1,3,5,7 value
    pop     cx              ;restore  NO. of GPIO chip
    push    cx              ;save NO. of GPIO chip
    mov     ax,5e87h
    mov     bx,03FFh
    int     15h

    pop     cx              ;restore  NO. of GPIO chip
```

```
    push    cx              ;save NO. of GPIO chip
    dec     cx

    mov     al,Fail_lenght
    mul     cl
    lea     dx, Fail_Str
    add     dx,ax
    cmp     bl,33h
    jne    test_result

    cmp    al,00h
    jne    test_fail
 ;4.Set GPIO 1,3,5,7 as output,GPIO 0,2,4,6 as input
    pop     cx
    push    cx
    mov     ax,5e87h
    mov     bx,0255h
    int     15h
;5. Set GPIO 1,3,5,7 Output High
    pop     cx              ;restore  NO. of GPIO chip
    push    cx              ;save NO. of GPIO chip
    mov     ax,5e87h
    mov     bx,04ffh
    int     15h
;6. Check GPIO 0,2,4,6 value
    pop     cx              ;restore  NO. of GPIO chip
    push    cx              ;save NO. of GPIO chip
    mov     ax,5e87h
    mov     bx,0300h
    int     15h

    pop     cx              ;restore  NO. of GPIO chip
    push    cx              ;save NO. of GPIO chip
    dec     cx

    mov     al,Fail_lenght
    mul     cl
    lea     dx, Fail_Str
    add     dx,ax
    cmp     bl,0ffh
    jne     test_result


 ;4. Set GPIO 1,3,5,7 Output differential
    pop     cx              ;restore  NO. of GPIO chip
```

```
            push    cx              ;save NO. of GPIO chip
            mov     ax,5e87h
            mov     bx,0422h
            int     15h
        ;5. Check GPI 0,2,4,6 value
            pop     cx              ;restore  NO. of GPIO chip
            push    cx              ;save NO. of GPIO chip
            mov     ax,5e87h
            mov     bx,03FFh
            int     15h

            pop     cx              ;restore  NO. of GPIO chip
            push    cx              ;save NO. of GPIO chip
            dec     cx

            mov     al,Fail_lenght
            mul     cl
            lea     dx, Fail_Str
            add     dx,ax
            cmp     bl,33h
            jne     test_result

            pop     cx              ;restore  NO. of GPIO chip
            push    cx              ;save NO. of GPIO chip
            dec     cx
            mov     al,Success_lenght
            mul     cl
            lea     dx, Success1_Str
            add     dx,ax

        ;Do Second PCA9554 test
        ;1.Set GPIO 0,2,4,6 as output, GPI 1,3,5,7 as input

test_result:
            mov     ah,09h
            int     21h
            pop     cx
            dec     cx
            jnz     next_test
    Finish_Test:
            popa
            .exit
```

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