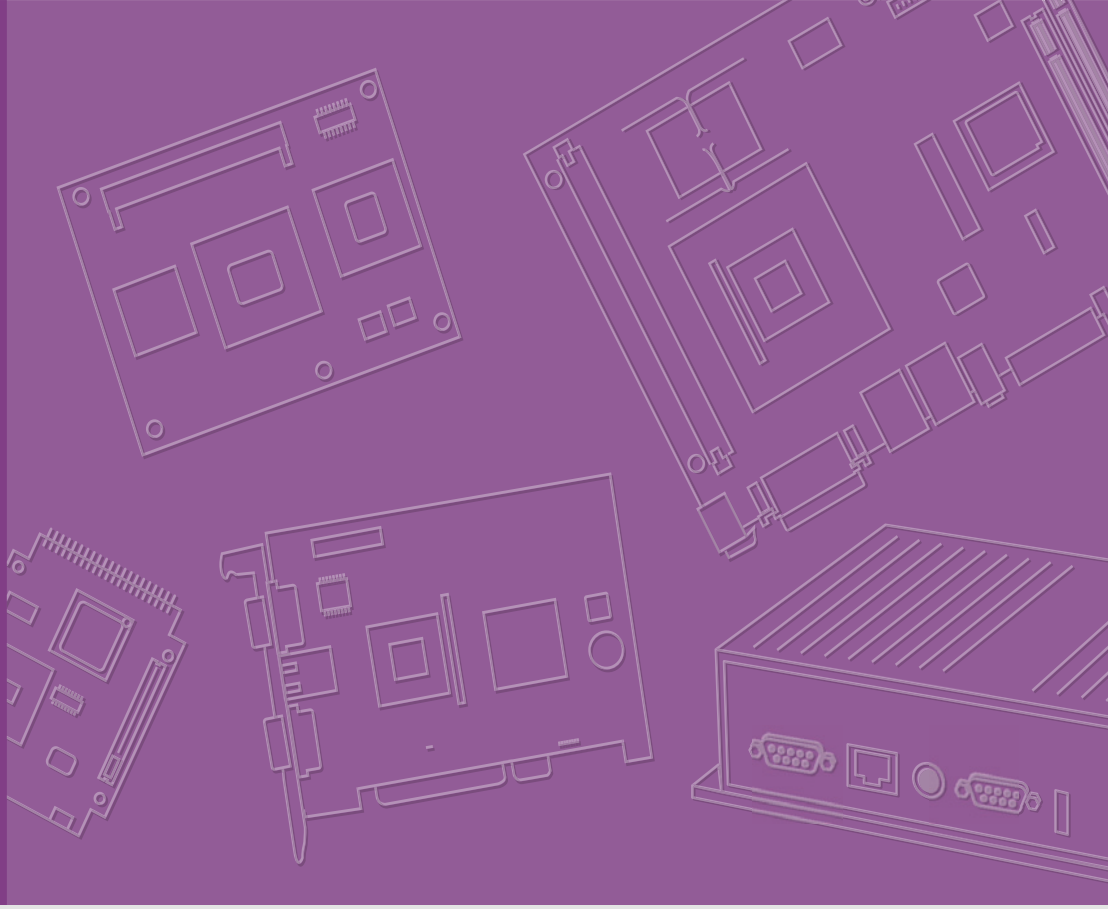


User Manual

PCM-3356

PC/104 SBC w/AMD® T16R, VGA, LVDS, LAN, USB, COM and on-board memory

ADVANTECH

Enabling an Intelligent Planet

Copyright

The documentation and the software included with this product are copyrighted 2013 by Advantech Co., Ltd. All rights are reserved. Advantech Co., Ltd. reserves the right to make improvements in the products described in this manual at any time without notice. No part of this manual may be reproduced, copied, translated or transmitted in any form or by any means without the prior written permission of Advantech Co., Ltd. Information provided in this manual is intended to be accurate and reliable. However, Advantech Co., Ltd. assumes no responsibility for its use, nor for any infringements of the rights of third parties, which may result from its use.

Acknowledgements

AMD is a trademark of Advanced Micro Devices.

AMI is a trademark of American Megatrends Inc.

IBM, PC/AT, PS/2 and VGA are trademarks of International Business Machines Corporation.

Microsoft Windows® is a registered trademark of Microsoft Corp.

RTL is a trademark of Realtek Semi-Conductor Co., Ltd. ESS is a trademark of ESS Technology, Inc.

UMC is a trademark of United Microelectronics Corporation.

SMI is a trademark of Silicon Motion, Inc.

Creative is a trademark of Creative Technology LTD.

All other product names or trademarks are properties of their respective owners.

Part No. 2006335610 Edition 1

Printed in China September 2013

Packing List

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

- 1 PCM-3356 SBC
- 1 x SATA data cable (p/n: 1700018799)
- 1 x VGA cable (p/n: 1700000898)
- 2 x USB cable (bracket type with two USB ports) (p/n: 1703100121)
- 1 x RS-232 COM cable (p/n: 1701200220)
- 1 x RS-422/485 COM cable (p/n: 1700019414)
- 1 x AT/ATX Power cable (p/n: 1700003491)
- 1 x SATA Power cable (p/n: 1700018259)
- 2 x Ethernet RJ-45 Conn. conversion cable (p/n: 1700017863)
- 1 x Audio cable (p/n: 1700020638-01)
- 1 x Startup manual

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

Order Information

Model No.List	Description
PCM-3356F-M0A1E	AMD T16R PC/104 SBC, up to 4GB DDR3 SO-DIMM

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

Contents

Chapter 1 General Information 1

1.1 Introduction 2
1.2 Features 2
1.3 Specifications 2
1.3.1 Standard PC/104 Biscuit SBC Functions 2
1.3.2 VGA/LVDS Interface 2
1.3.3 Ethernet Interface 3
1.3.4 OS support 3
1.3.5 Mechanical and Environmental 3

Chapter 2 Installation 5

2.1 Jumpers 6
Table 2.1: Jumpers 6
2.1.1 Jumper Setting 6
2.2 Connectors 7
Table 2.2: Connectors 7
2.3 Mechanical 8
2.3.1 Connector Location 8
Figure 2.1 Connectors (component side) 8
Figure 2.2 Connectors (solder side) 8
2.3.2 Board Dimensions 9
Figure 2.3 Board Dimension Layout (Component Side) 9
Figure 2.4 Board Dimension Layout (Solder Side) 10
2.4 Installing SODIMMs 10
2.5 High Definition Audio Interface (CN10) 10
2.6 VGA/LCD interface connections 11
2.6.1 CRT display connector (CN5) 11
2.6.2 LVDS connector (CN7) 11
2.6.3 Panel Inverter Power (CN6) 11
2.7 USB connectors (CN14 & CN24) 11
2.8 Front Panel Connector (CN18) 11
2.9 Buzzer Connector (CN11) 12
2.10 SATA Connector (CN16) 12
2.11 COM port connector (CN20 & CN23) 12
2.12 Giga LAN Connector (CN8 & CN9) 12
2.12.1 LAN LED Connector (CN38 & CN39) 12
2.13 GPIO Connector (CN36) 12
2.14 Power Connectors (CN1) 12
2.15 Watchdog timer configuration 12

Chapter 3 AMI BIOS Setup 13

3.1 Introduction 14
3.2 Entering Setup 15
3.2.1 Main Setup 15
3.2.2 Advanced BIOS Features Setup 16
3.2.3 Chipset Configuration 26
3.2.4 Boot Configuration 30
3.2.5 Security Configuration 31
3.2.6 Save & Exit 32

Chapter 4 Software Introduction & Installation 33

4.1 S/W Introduction 34
4.2 Driver Installation 34
4.2.1 Windows XP Professional 34
4.2.2 Other OS 34
4.3 Value-Added Software Services 34
4.3.1 SUSI Introduction 34
4.3.2 Software APIs 35
4.3.3 SUSI Utilities 35
4.3.4 SUSI Installation 36
4.3.5 SUSI Sample Programs 37

Appendix A Pin Assignments 45

A.1 Jumper and Connector Tables 46

Appendix B System Assignments 63

B.1 System I/O Ports 64
Table B.1: System I/O ports 64
B.2 1st MB Memory Map 64
Table B.2: 1st MB memory map 64
B.3 Interrupt assignments 65
Table B.3: Interrupt assignments 65

Appendix C Watchdog Timer Sample Code 67

C.1 Watchdog Timer Sample Code 68

Chapter 1

General Information

1.1 Introduction

The PCM-3356 is a fanless, low power, small size (96 x 90 mm) and performance PC/104-plus SBC (Single Board Computer) geared to satisfy the needs for various industrial computing equipment. PCM-3356 is ideal for communication, environment monitoring, factory automation, military and medical applications that require flat panel support using digital displays with TTL interfaces and single Ethernet ports.

For those who want superior performance for various low-power embedded applications, PCM-3356 uses AMD T16R processor, supporting DDRII 667 SDRAM up to 2GB.

1.2 Features

- AMD T16R Processor
- Supports DDR3 1066MHz memory
- Supports 18-bit LVDS LCD interface
- Supports 1 X SATA2 interface
- Supports up to 4GB SO-DIMM
- Supports 2 x 10/100/1000 Mbps Fast Ethernet
- Supports 4 x USB2.0 ports
- Supports 3 x COM ports
- PC/104 expansion interface

1.3 Specifications

1.3.1 Standard PC/104 Biscuit SBC Functions

- **CPU:** AMD T16R Processor
- **System Memory:** supports DDR3 1066MHz SDRAM, up to 4GB
- **L2 Cache Memory:** 512 KB on the processor
- **System Chipset:** AMD® A55E
- **BIOS:** AMI 32Mbit Flash BIOS
- **Watchdog timer:** 255 levels timer interval
- **Expansion Interface:** PC/104 (ISA bus)
- **Battery:** Lithium 3V/210 mAH
- **Power management:** ACPI supported
- **Serial ATA:** One SATA2 interface, Speed up to 300MB/s
- **Serial ports:** 3 RS-232/422/485 with auto flow control
- **USB:** Four USB 2.0 ports compliant universal serial bus ports
- **GPIO:** 8 bit general purpose Input/Output
- **High Definition Audio:** ALC892 Codec

1.3.2 VGA/LVDS Interface

- **Graphic Engine:** DirectX 11 graphics with UVD 3.0, OCL 1.1, OGL 4.0
- **VRAM:** up to 384 MB shared system memory
- **Output Interfaces:**
  - VGA: Supports up to 1920 x 1200 @ 85Hz
  - LVDS: 18-bit LVDS up to 1280 x 800
  - Dual Display: VGA + LVDS

1.3.3 Ethernet Interface

- Supports Dual 10/100/1000 Mbps Ethernet networking
- **Controller:** AMD® G-Series

1.3.4 OS support

This board supports Win7, Win XP, WES7, Win XPE, and WinCE.

For further information about OS support in your PCM-3356, 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 115 mm (3.8" x 4.5") Mechanical Drawing (dxf file) is available.
- **Power Supply Type:** AT/ATX
- **Power Requirement:** +5 V ± 5%, +12 V ± 5% (Optional), (5V only,12V optional for PC104 add on card and LCD inverter)
- **Power Consumption:**
  - Max: +5 V@ 1.65 A
  - Typical: +5 V@ 1.38 A
- **Operating temperature:** 0 ~ 60°C (32 ~ 140°F) (operation humidity: 40°C @ 85% RH Non-Condensing)
- **Weight:** 0.59 kg (reference weight of total package)
- **Board layout:** dimensions

Chapter 2

Installation

This chapter explains the setup procedures of the PCM-3356 hardware, including instructions on setting jumpers and connecting peripherals, switches and indicators. Be sure to read all safety precautions before you begin the installation procedure.

2.1 Jumpers

The PCM-3356 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	LCD Power
J2	Auto Power On Setting
J3	Clear CMOS

2.1.1 Jumper Setting

J1	**LCD Power**
Part Number	1653003101
Footprint	HD_3x1P_79_D
Description	PIN HEADER 3x1P 2.0mm 180D(M) DIP 2000-13 WS
Setting	Function
(1-2)	+5V
(2-3)*	+3.3V

J2	**Auto Power On 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	Power Button for Power On
(1-2)*	Auto Power On

J3	Clear CMOS
Part Number	1653003101
Footprint	HD_3x1P_79_D
Description	PIN HEADER 3x1P 2.0mm 180D(M) DIP 2000-13 WS
Setting	Function
(1-2)*	Normal
(2-3)	Clear COMS

2.2 Connectors

Onboard connectors link the PCM-3356 to external devices such as hard disk drives, a keyboard, or floppy drives. The table below lists the function of each of the board's connectors.

Table 2.2: Connectors

Label	Function
CN1	Power Input
CN2	SODIMM Socket 204 Pin
CN3	BIOS Socket
CN5	VGA
CN6	Inverter Power Output
CN7	18-bit LVDS Panel
CN8	LAN
CN9	LAN
CN10	Audio
CN11	Buzzer
CN12	PC/104
CN13	ISA -5V & -12V Input
CN14	Internal USB
CN15	mSATA
CN16	SATA
CN17	SATA Power
CN18	Front Panel
CN19	Mini PCIe
CN20	COM1/COM2
CN21	SMBus
CN22	COM3
CN24	Internal USB
CN36	GPIO
CN38	LAN LED
CN39	LAN LED

2.3 Mechanical

2.3.1 Connector Location

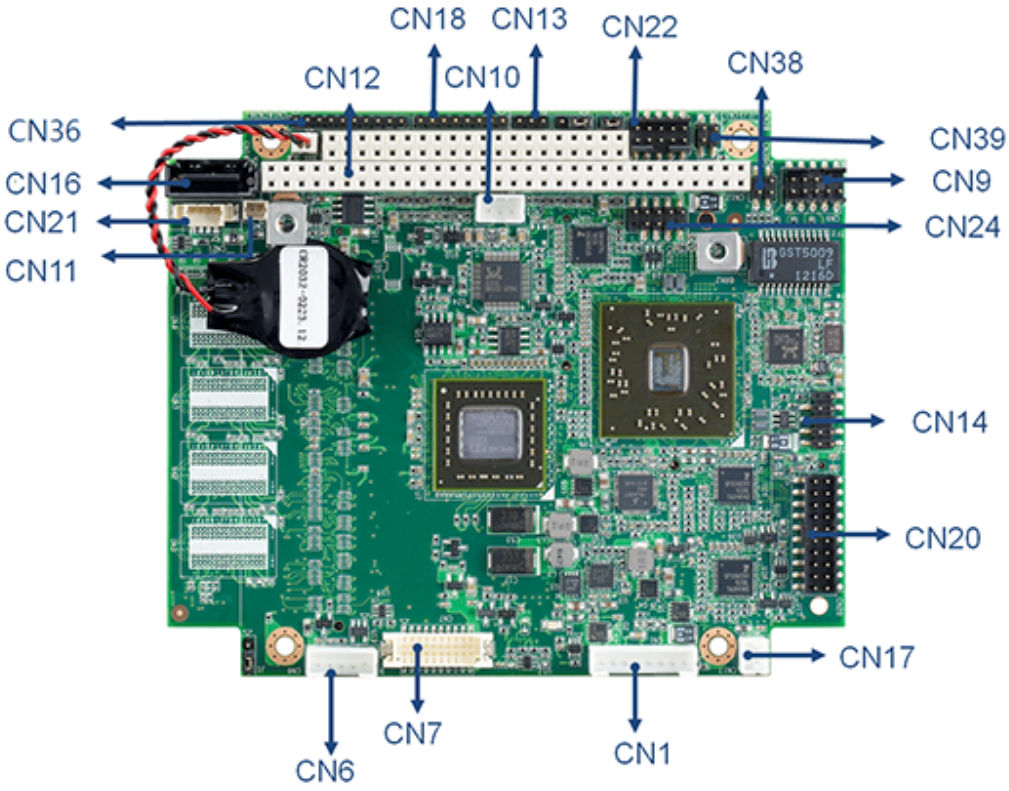


Figure 2.1 Connectors (component side)

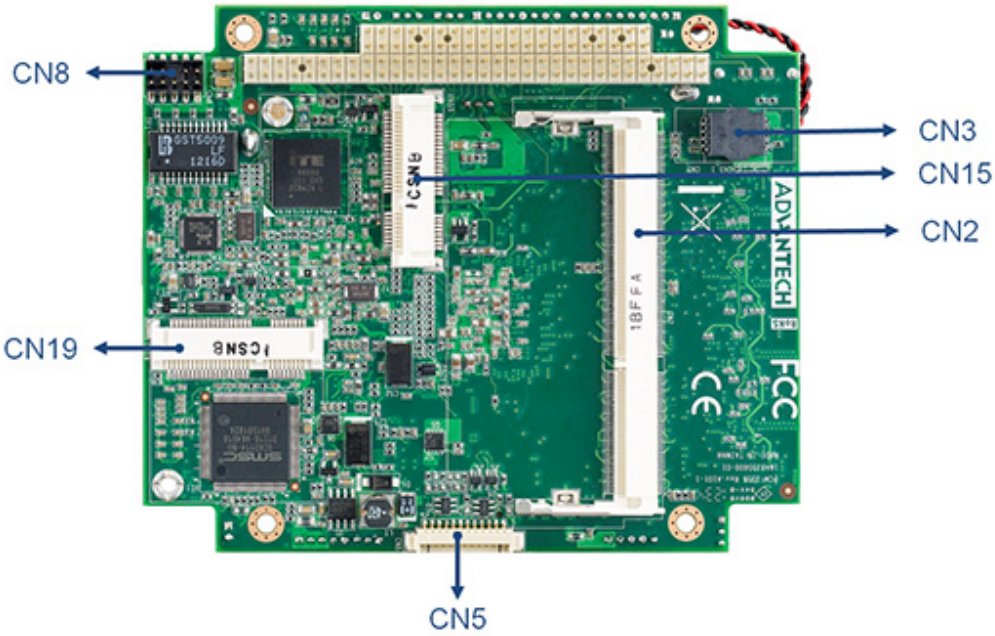


Figure 2.2 Connectors (solder side)

2.3.2 Board Dimensions

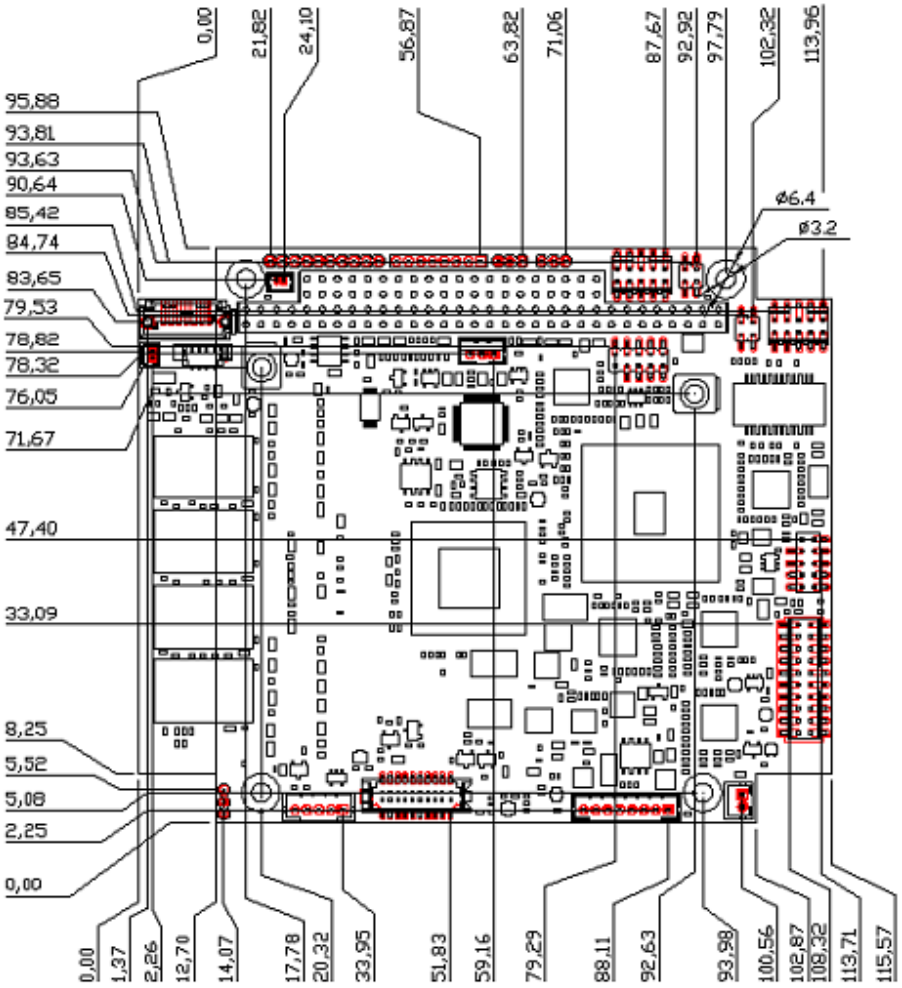


Figure 2.3 Board Dimension Layout (Component Side)

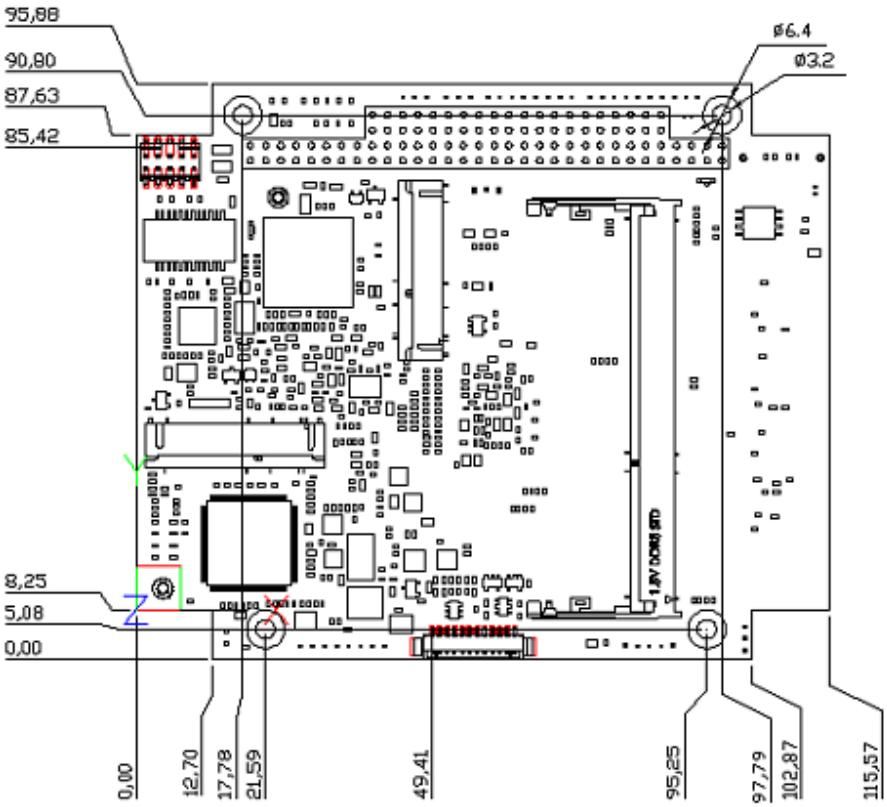


Figure 2.4 Board Dimension Layout (Solder Side)

2.4 Installing SODIMMs

The procedures for installing SODIMMs are described below. Please follow these steps carefully. You can install SDRAM memory modules using 200-pin SODIMMs (Small Outline Dual In-line Memory Modules).

1. Ensure that all power supplies to the system are switched off.
2. Tilt the SODIMM card just above the board and slide it into the housing card slot.
3. Push the module into the socket until the module gently snaps in. There should only be a slight insertion force to engage the module into the contacts. Make sure that the module and the housing are aligned and locked in place.

2.5 High Definition Audio Interface (CN10)

The PCM-3356 has codec on board and can provide high definition audio interface.

2.6 VGA/LCD interface connections

The PCM-3356'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 (CN5)

CN5 is a 12-pin, dual-inline header used for conventional CRT displays. A simple one-to-one adapter can be used to match CN5 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 1060 @ 60Hz. Pin assignments for CRT display connector CN8 are detailed in Appendix A.

2.6.2 LVDS connector (CN7)

The PCM-3356 uses AMD T16R that supports 18-bit LVDS panel up to1280 x 800 panel resolution.

2.6.3 Panel Inverter Power (CN6)

The LCD inverter is connected to CN6 via a 5-pin connector to provide +5 V/+12 V power to the LCD display. JP1 provides inverter voltage selection function, closing Pin 1, 2 is for 5 V power input inverter; closing Pin 2, 3 is for 3.3 V power input inverter.

2.7 USB connectors (CN14 & CN24)

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 (CN18)

You may want to install external switches to monitor and control the PCM-3356. These features are optional: install them only if you need them.

Power Button(Pin1 & Pin2)

PCM-3356 supports power on/off button.

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 (CN11)

PCM-3356 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 (CN16)

PCM-3356 features one high performance serial ATA interfaces (up to 300 MB/s) that eases cabling to hard drives with thin and long cables while your application need more large storage capacity.

2.11 COM port connector (CN20 & CN23)

The board provides three serial ports: three serial RS-232/422/485 ports in two 20 pin connector (CN20:COM1/2) and one 10pin connector (CN23: COM3).

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

2.12 Giga LAN Connector (CN8 & CN9)

PCM-3356 uses the Intel? 82567V Gigabit LAN chips are linked to dedicated PCIe x1 lanes. PCM-3356 provide high throughputs for heavy loading networking environment. LAN connections are made via two internal 10-pin box header.

2.12.1 LAN LED Connector (CN38 & CN39)

PCM-3356 provides an external LAN LED Pin header for connecting to the front side of the chassis. With this convenient design users may know whether the LAN port is acting or not easily. Refer to Appendix for detailed information on the pin assignments.

2.13 GPIO Connector (CN36)

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

2.14 Power Connectors (CN1)

Supplies main power +5 V to the PCM-3356, and to devices that require +12 V.

2.15 Watchdog timer configuration

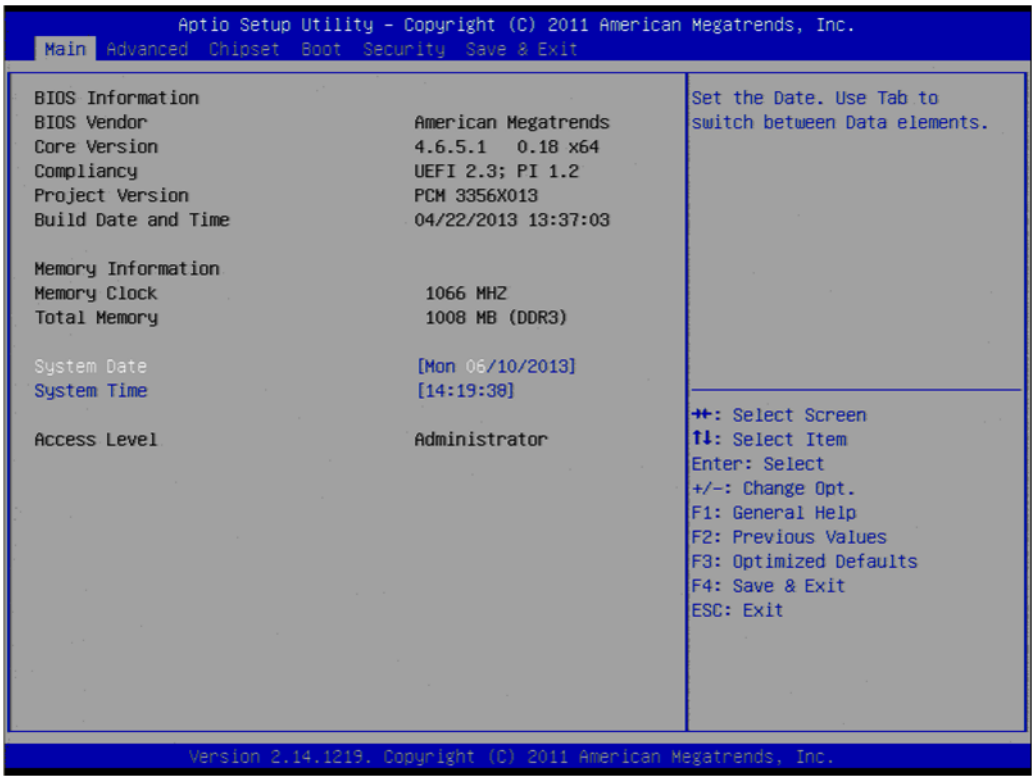
An onboard watchdog timer reduces the chance of disruptions which EMP (electro magnetic pulse) interference can cause. This is an invaluable protective device for standalone or unmanned applications. Setup involves one jumper and running the control software (refer to Appendix).

Chapter 3

AMI BIOS Setup

3.1 Introduction

AMIBIOS has been integrated into many motherboards for 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-3356 BIOS setup screens.



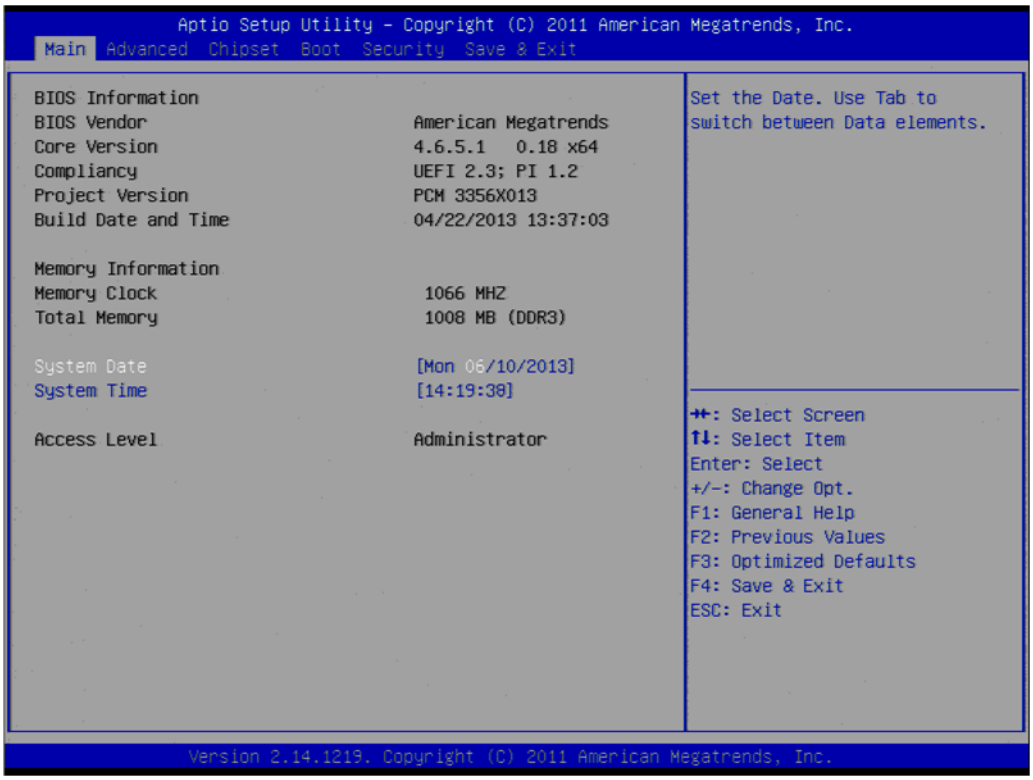
AMI's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This information is stored in battery-backed CMOS so it retains the Setup information when the power is turned off.

3.2 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.

3.2.1 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.



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.

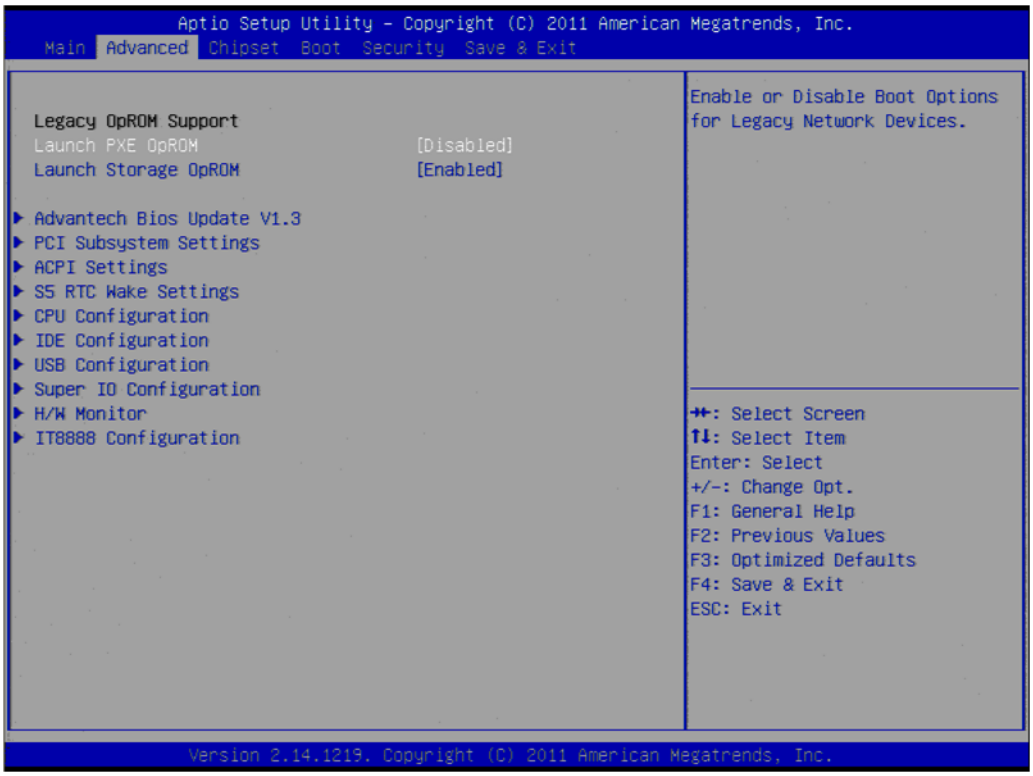
Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

3.2.1.1 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.

3.2.2 Advanced BIOS Features Setup

Select the Advanced tab from the PCM-3356 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 screen is shown below. The sub menus are described on the following pages.



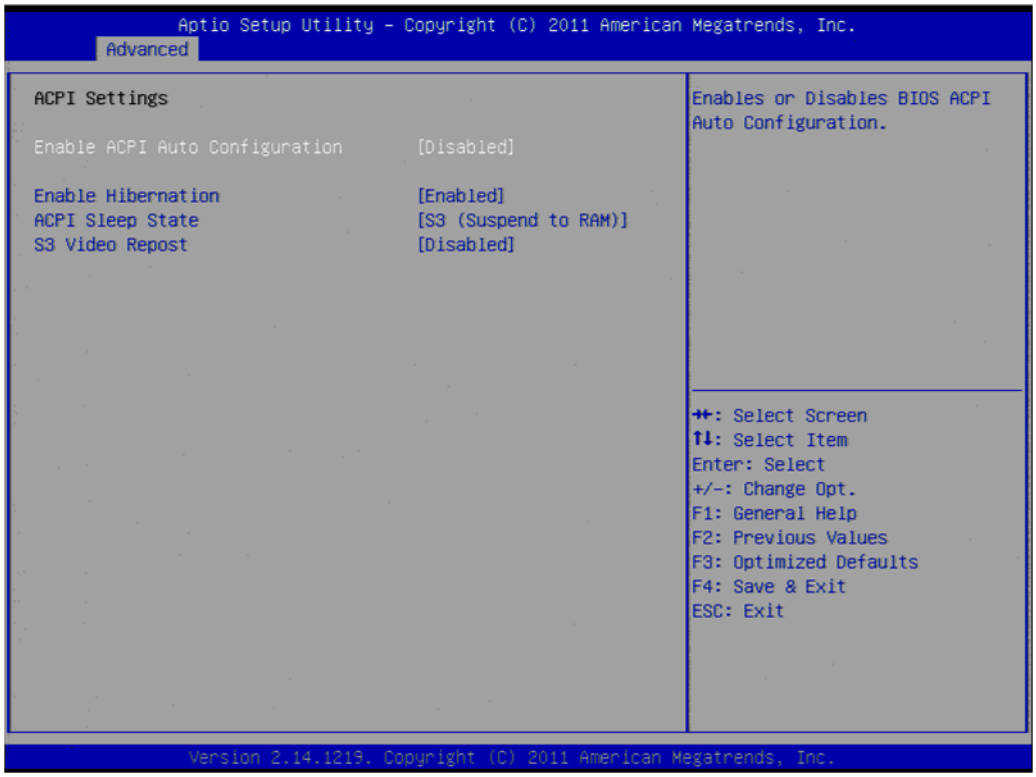
3.2.2.1 Advantech Bios Update V1.3

Advantech Bios update function.

3.2.2.2 PCI Subsystem Settings Configuration

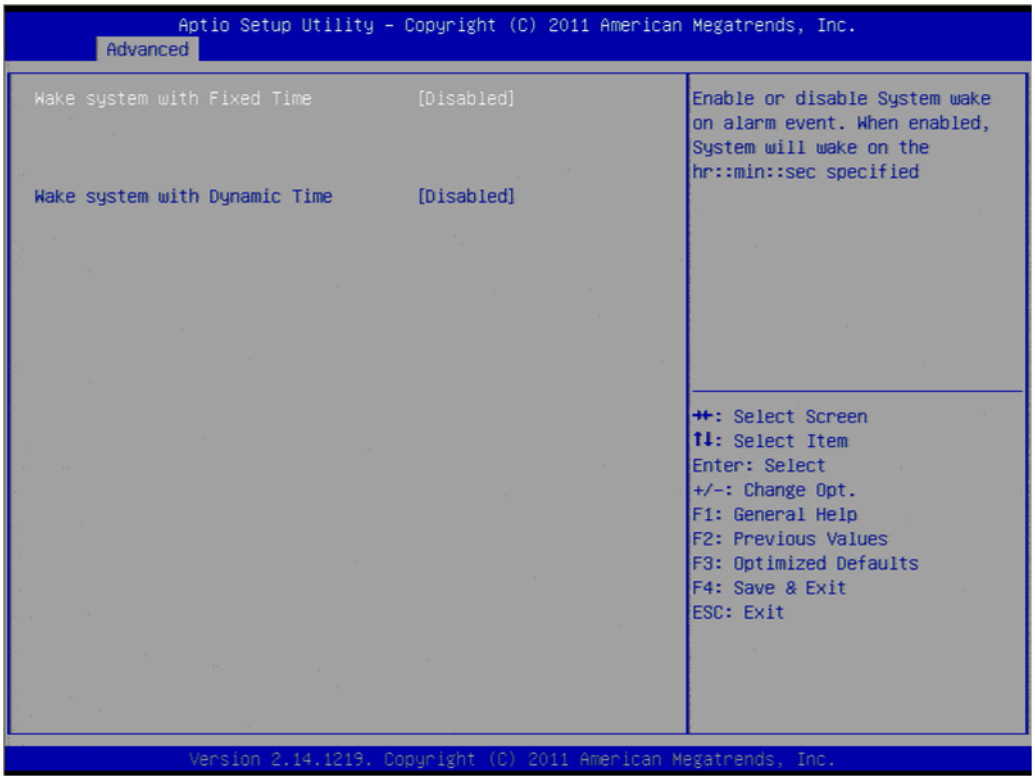
- **PCI ROM Priority**
  This item allows you to select the EFI ROM and Legacy ROM priority.
- **PCI Latency Timer**
  This item allows you to select the 32/64/96/128/160/192/224/248 PCI bus clocks.
- **VGA Palette Snoop**
  Enabled or disable VGA palette registers snooping.
- **PERR# Generation**
  Enabled or disable PCI device to generation PERR#.
- **SERR# Generation**
  Enabled or disable PCI device to generation SERR#.
- **PCI Express Settings**
  Change PCI express device detail settings.

3.2.2.3 ACPI Settings Configuration



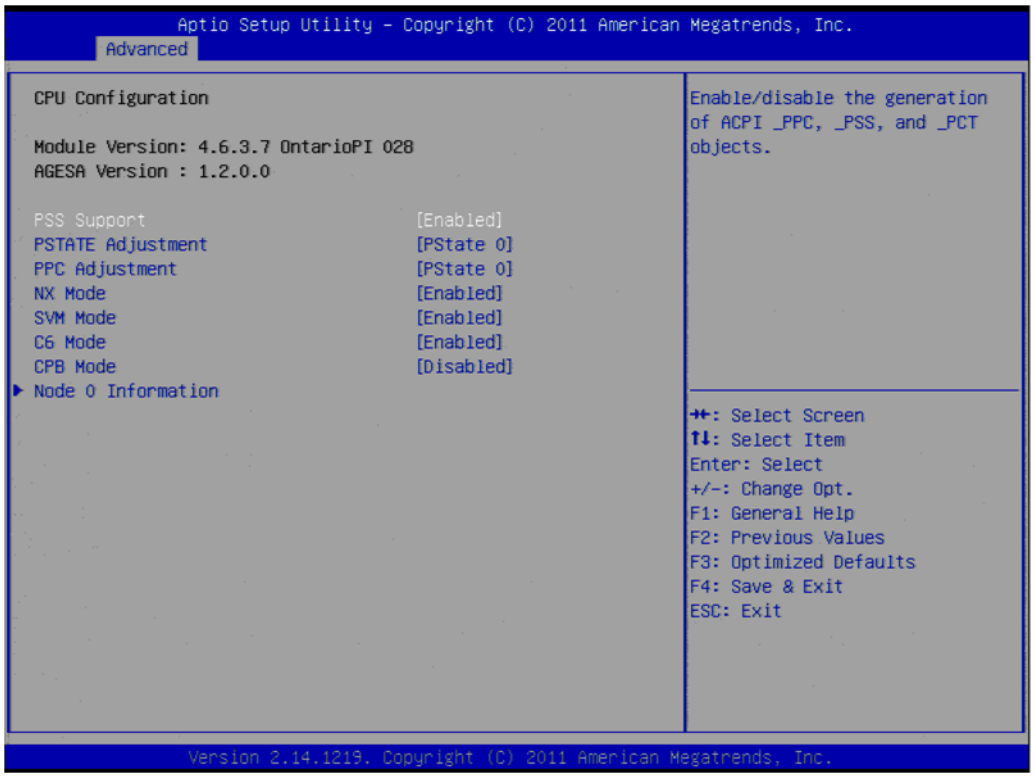
- **Enable ACPI Auto Configuration**
  Enable or disable BIOS ACPI auto configuration.
- **Enable Hibernation**
  Enable or disable hibernation function if OS support.
- **ACPI Sleep State**
  Select the ACPI states used for system suspend.
- **S3 Video Repost**
  Enable or disable video repost.

3.2.2.4 S5 RTC Wake Settings



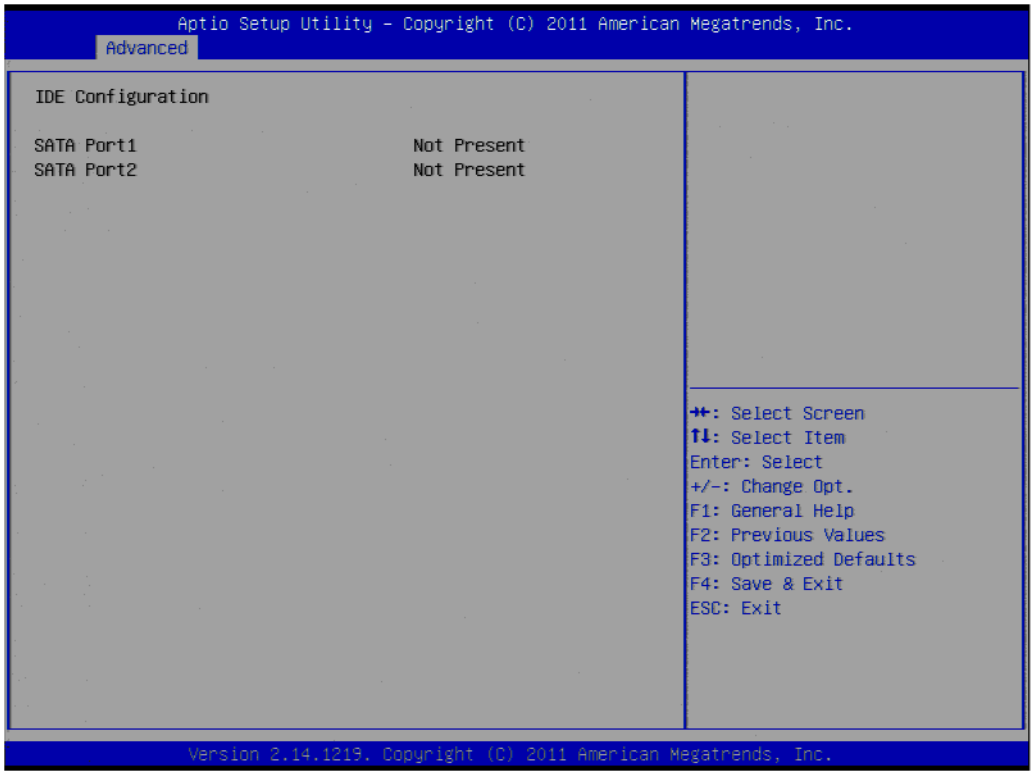
- **Wake system with Fixed Time**
  Enable or disable system wake on alarm event by user define.
- **Wake system with Dynamic Time**
  Enable or disable system wake on alarm event from 1minutes to 5 minutes.

3.2.2.5 CPU Configuration



- **PPS Support**
  This item allows you to enable or disable the ACPI _PPC, _PSS, and _PCT objects.
- **PSTATE Adjustment**
  This item allows you to provide P-state level.
- **PPC Adjustment**
  This item allows you to provide _PPC object.
- **NX Mode**
  This item allows you to enable or disable the No-execute page protection function.
- **SVM Mode**
  This item allows you to enable or disable the CPU virtualization.
- **C6 Mode**
  This item allows you to auto or disable C6 function.
- **CPB Mode**
  This item allows you to auto or disable CPB.
- **Node 0 Information**
  View detail of memory information related to node 0.

3.2.2.6 IDE Configuration

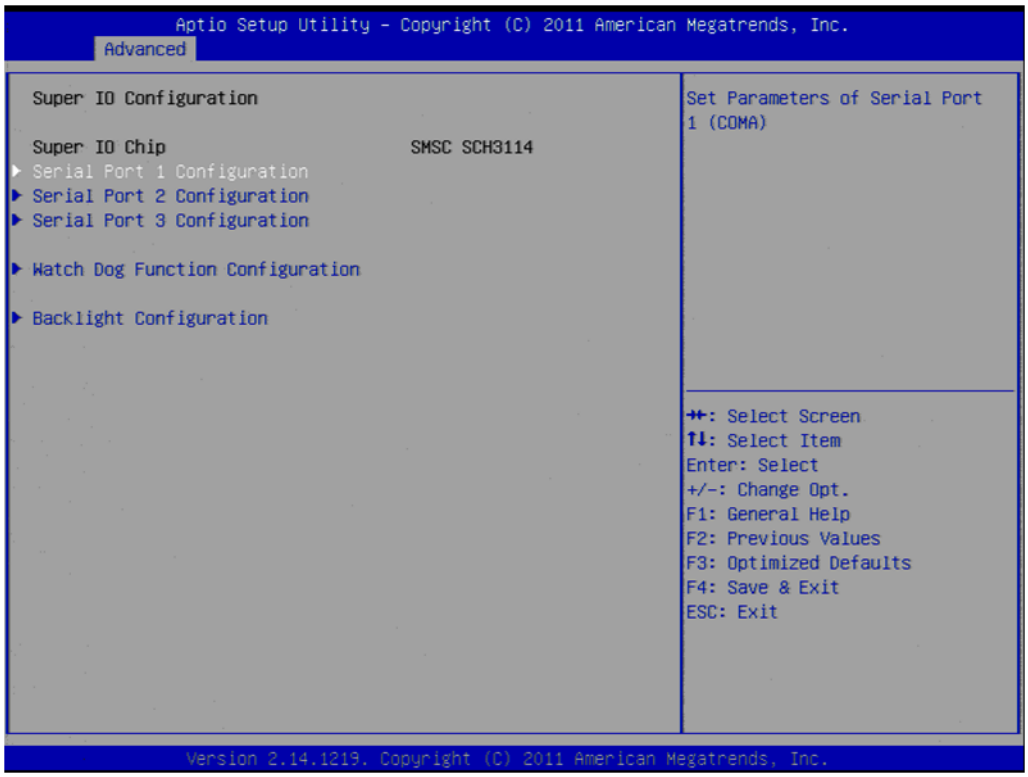


- **IDE Configuration**
  Display SATA Port1 / SATA Port2 information.

3.2.2.7 USB Configuration

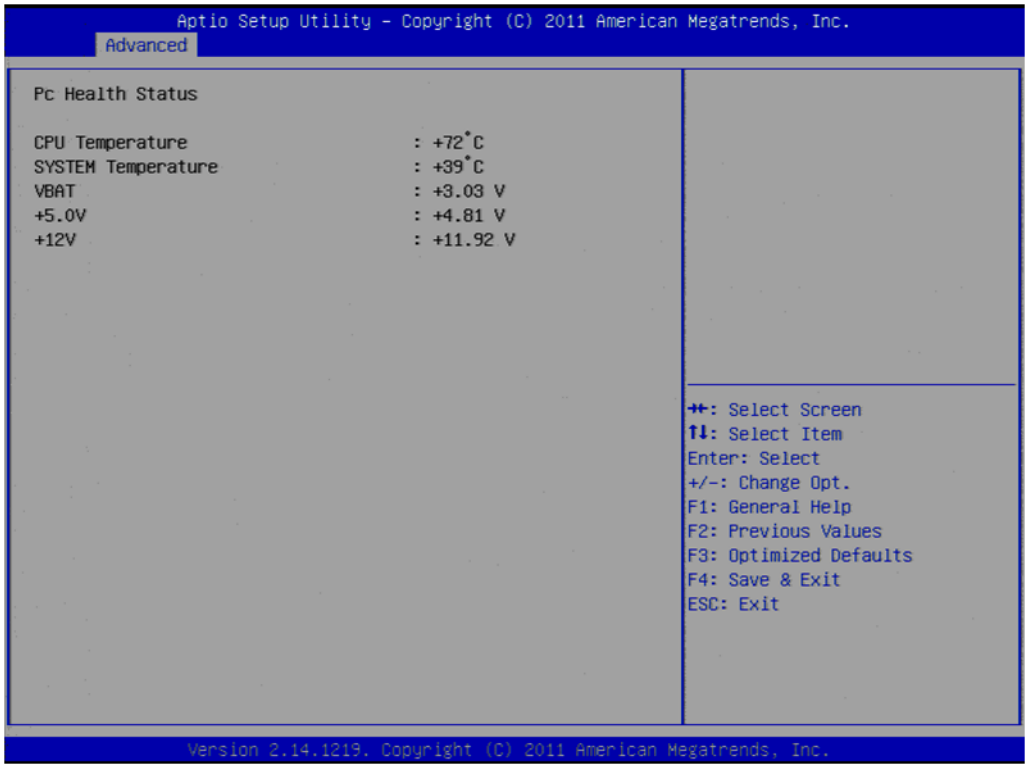
- **Legacy USB Support**
  Enables support for legacy USB. Auto option disables legacy support if no USB devices are connected.
- **EHCI Hand-Off**
  This is a workaround for OS without EHCI hand-off support. The EHCI ownership change should claim by EHCI driver.
- **USB transfer time-out**
  Time-out value for control, Bulk, and interrupt transfers.
- **Device reset time-out**
  USB mass storage device start unit command time-out.
- **Device power-up delay**
  Maximum time the device will take before it properly report itself to the host controller.

3.2.2.8 Super I/O Configuration



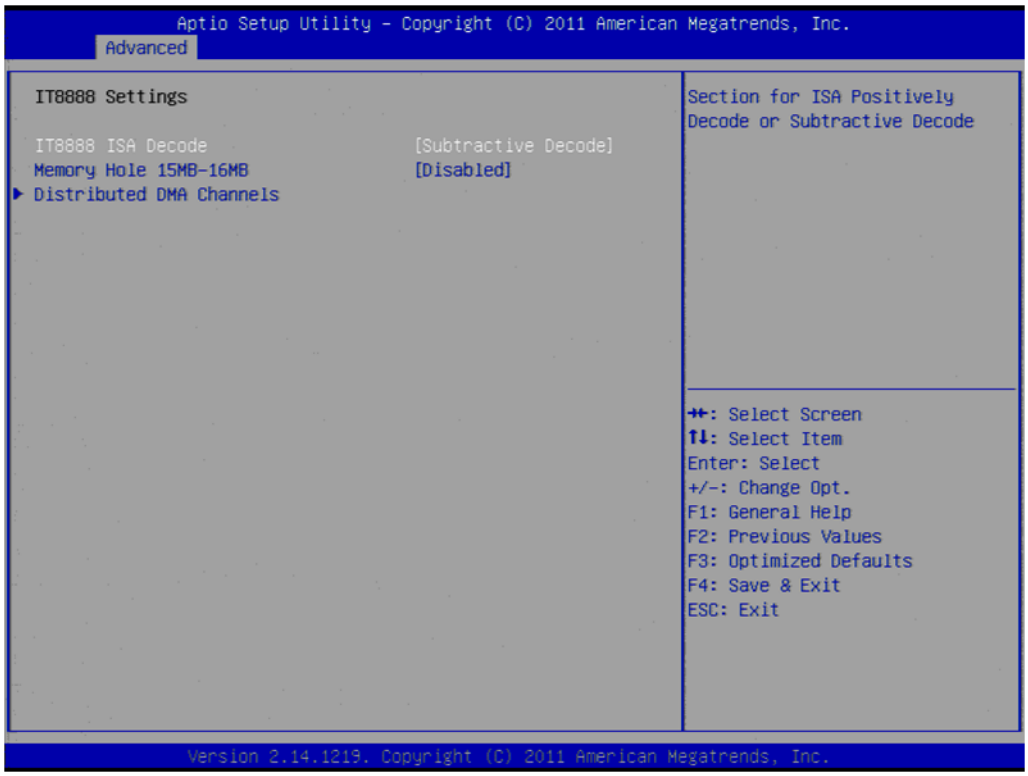
- **Serial Port1 / Port2 / Port3 address**
  This item allows you to select serial port1 ~ port3 of base addresses.
- **Serial Port1 / Port2 / Port3 IRQ**
  This item allows you to select serial port1 ~ port3 of IRQ.
- **COM Mode**
  This item allows you to select serial port1 ~ port3 mode(RS232/RS422/RS485) .
- **Auto Flow Control For Serial Port1 / Port2 / Port3**
  This item allows you to enable or disable auto flow control function.
- **Watch Dog Function Configuration**
  This item allows you to define watch dog timer by seconds or minutes to reset system under POST stage.
- **Backlight Configuration**
  This item allows you select DC or PWM mode for backlight.

3.2.2.9 H/W Monitor



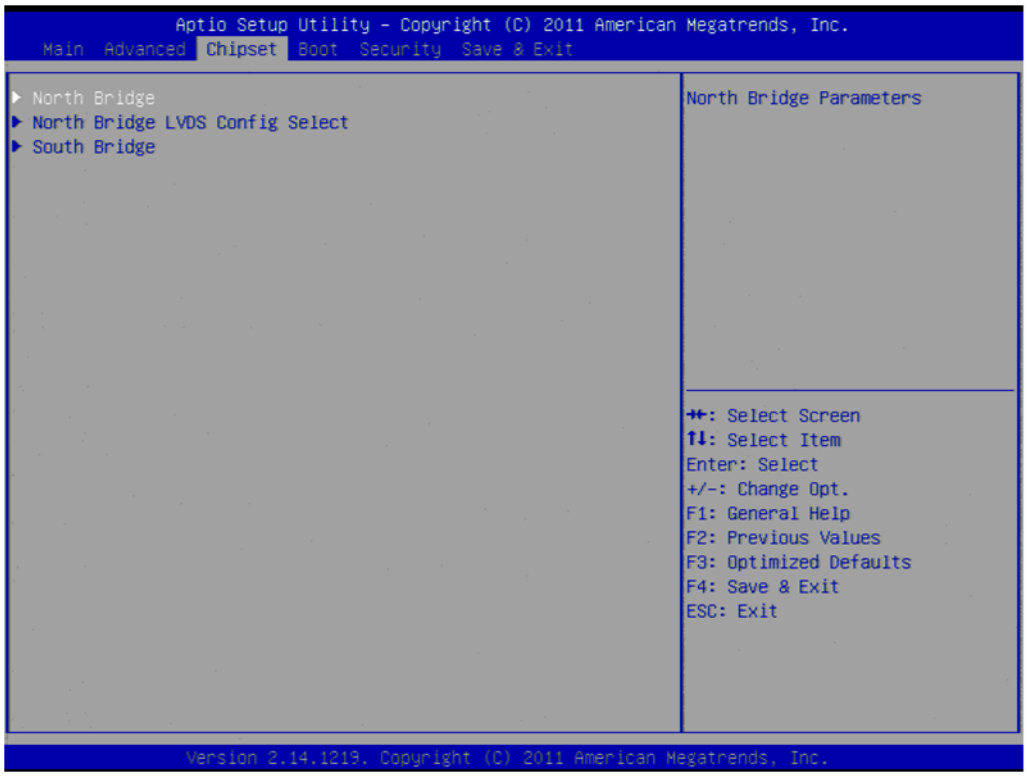
- **CPU Temperature/SYSTEM Temperature**
  Display current CPU/SYSTEM temperature.
- **VBAT / +5.0V / +12V**
  Display current VBAT/+5.0V/+12V voltage.

3.2.2.10 IT8888 Configuration



- **Serial Port1 / Port2 / Port3 / Port4 address**
  This item allows you to select serial port1 ~ port4 of base addresses.
- **Serial Port1 / Port2 / Port3 / Port4 IRQ**
  This item allows you to select serial port1 ~ port4 of IRQ.
- **Auto Flow Control For Serial Port1**
  This item allows you to enable or disable auto flow control function.

3.2.3 Chipset Configuration

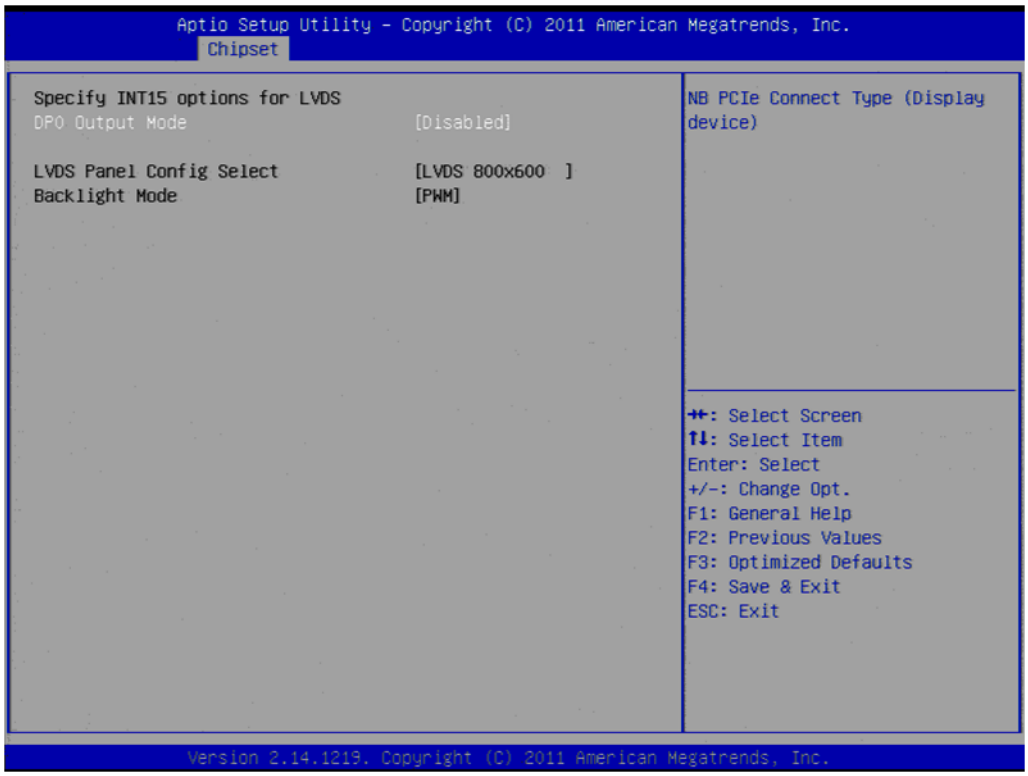


- **North Bridge**
  Detail for North Bridge items.
- **North Bridge LVDS Config Select**
  Detail for display items.
- **South Bridge**
  Detail for South Bridge items.

3.2.3.1 North Bridge Configuration

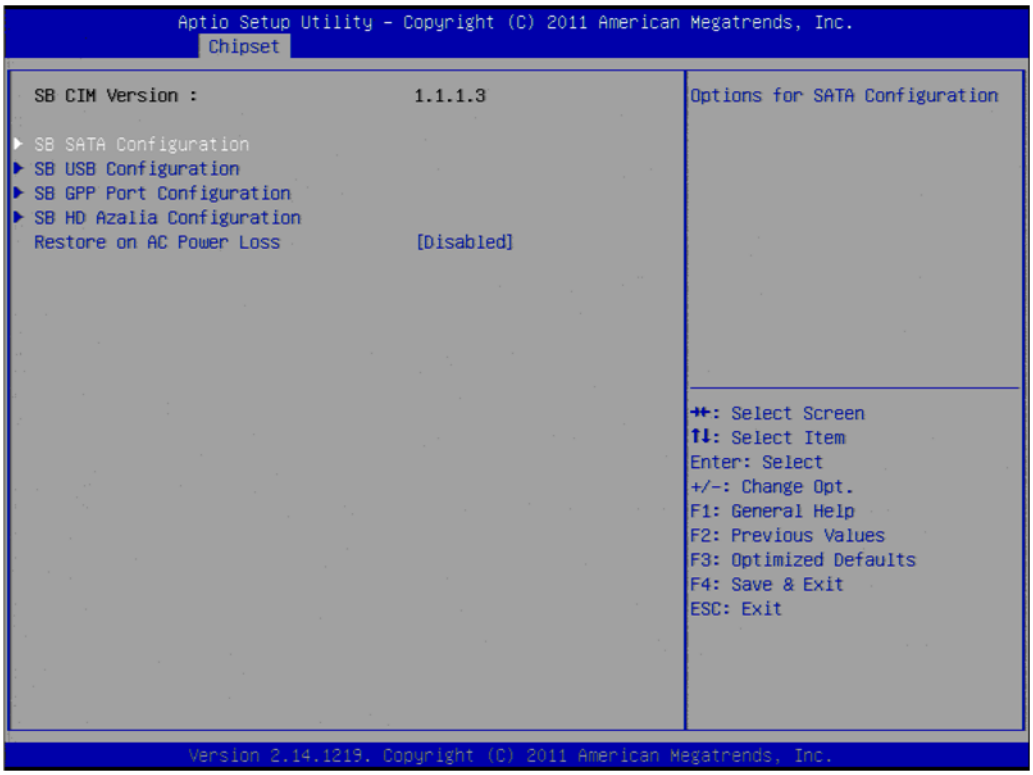
- **GFX Configuration**
  Detail of LAN1/LAN2/Mini PCIe, and PSPP Policy items.
- **Memory Configuration**
  Detail of Integrated Graphics, Bank Interleaving items.

3.2.3.2 North Bridge LVDS Config Select



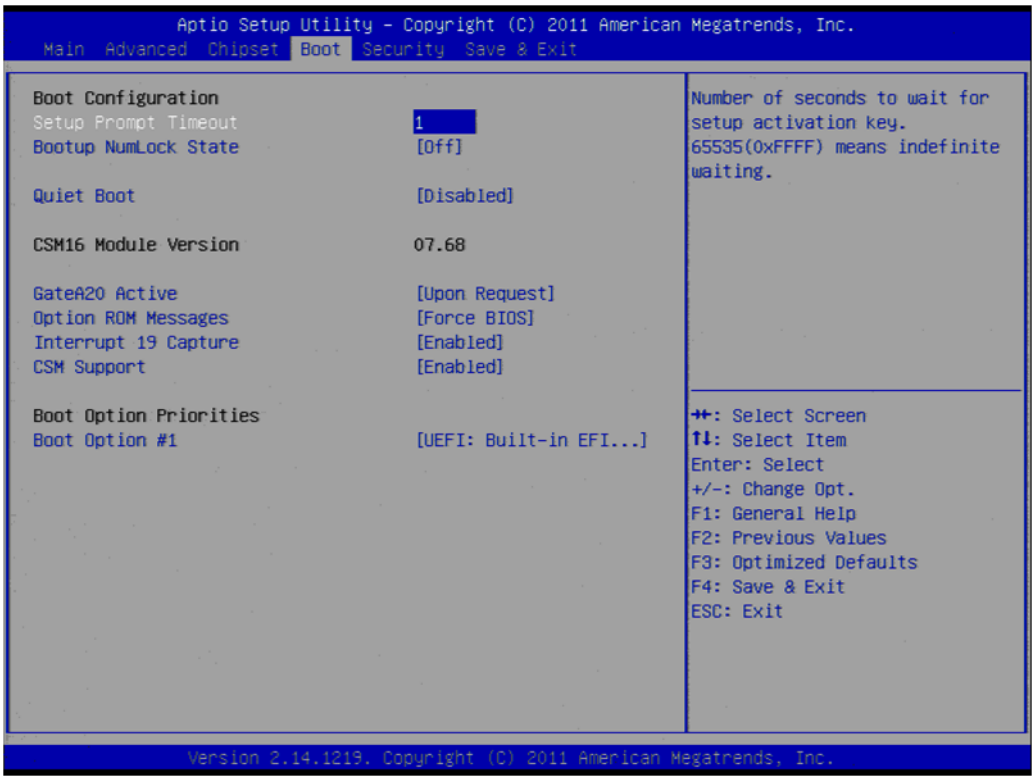
- **DP0 Output Mode**
  This item allows you to enable or disable LVDS function.
- **LVDS Panel Config Select**
  This item allows you to select LVAD panel type of resolution.
- **Backlight Mode**
  This item allows you to select backlight mode.

3.2.3.3 South Bridge



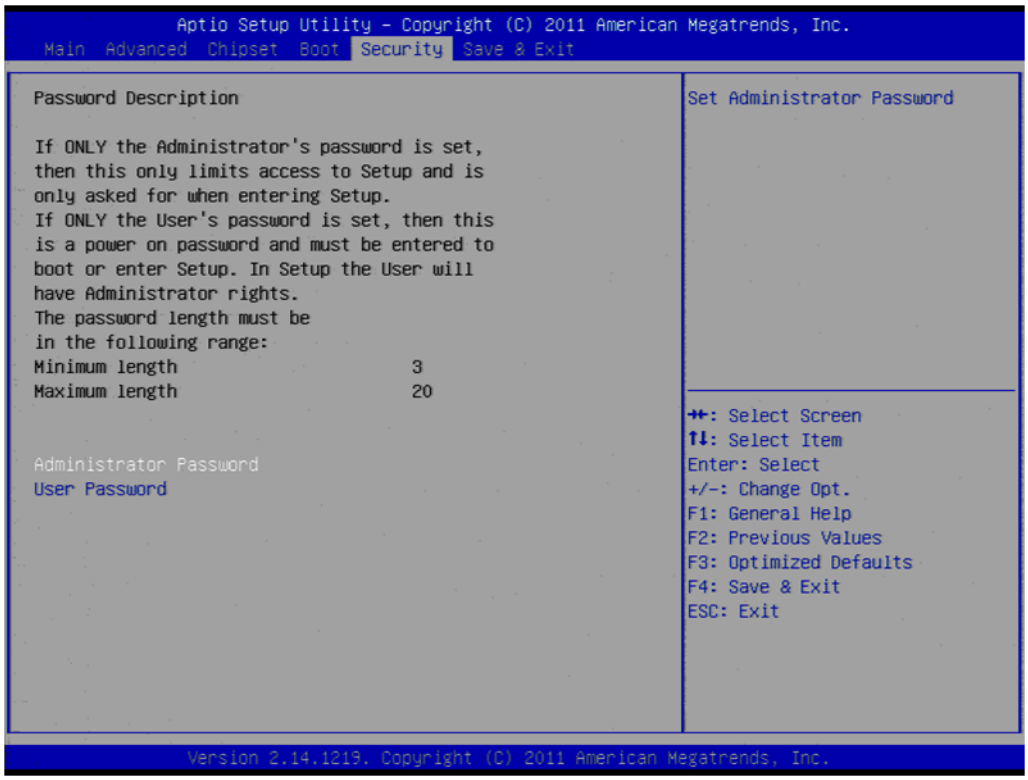
- **SB SATA Configuration**
  Options for SATA configuration.
- **SB USB Configuration**
  Options for SB USB configuration.
- **SB GPP Port Configuration**
  Options for SB GPP port configuration.
- **SB HD Azalia Configuration**
  Options for SB HD Azalia.
- **Restore on AC Power Loss**
  This item allows you to select system restore states if AC power loss.

3.2.4 Boot Configuration



- **Setup Prompt Timeout**
  This item allows you to change number of seconds to wait for setup activation key.
- **Bootup NumLock State**
  Select the Power-on state for Numlock.
- **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.
- **GateA20 Active**
  This item allows you to select Upon request or Always.
- **Option ROM Messages**
  Set display mode for option ROM.
- **Interrupt 19 Capture**
  This item allows option ROMs to trap interrupt 19.
- **CSM Support**
  This item allows you to enable or disable CSM support.
- **Boot Option**
  Sets the system boot order.

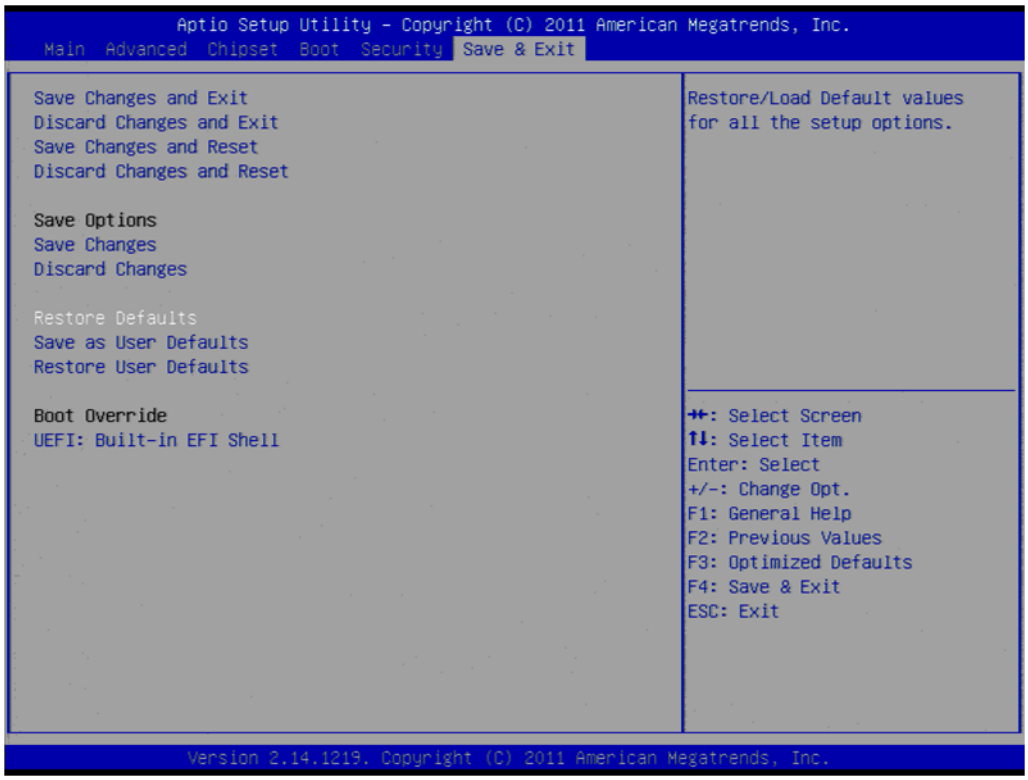
3.2.5 Security Configuration



Select Security Setup from the PCM-3356 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**

3.2.6 Save & Exit



- **Save Changes and Exit**
  This item allows you to exit system setup after saving the changes.
- **Discard Changes and Exit**
  This item allows you to exit system setup without saving any changes.
- **Save Changes and Reset**
  This item allows you to reset the system after saving the changes.
- **Discard Changes and Reset**
  This item allows you to rest system setup without saving any changes.
- **Save Changes**
  This item allows you to save changes done so far to any of the options.
- **Discard Changes**
  This item allows you to discard changes done so far to any of the options.
- **Restore Defaults**
  This item allows you to restore/load default values for all the options.
- **Save as User Defaults**
  This item allows you to save the changes done so far as user defaults.
- **Restore User Defaults**
  This item allows you to restore the user defaults to all the options.
- **Boot Override**
  Boot device select can override your boot priority.

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 or Linux, please browse the CD to run the setup file under each chipset folder on the CD-ROM.

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, SMBus, GPIO, and VGA control. Each category of API in SUSI is briefly described below.

4.3.2 Software APIs

PCM-3356 supports software APIs including GPIO, 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 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.

4.3.2.3 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.

4.3.2.4 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 the target of interests for 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

4.3.3 SUSI Utilities

PCM-3356 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 remote connection: Telnet server and FTP server, allowing the administrator to rescue the system.

Note! *eSOS Utility support on PCM-3356 is required to have 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 screen shot opens asking whether you want to modify, repair or remove the soft- ware. 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.

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, 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.

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.

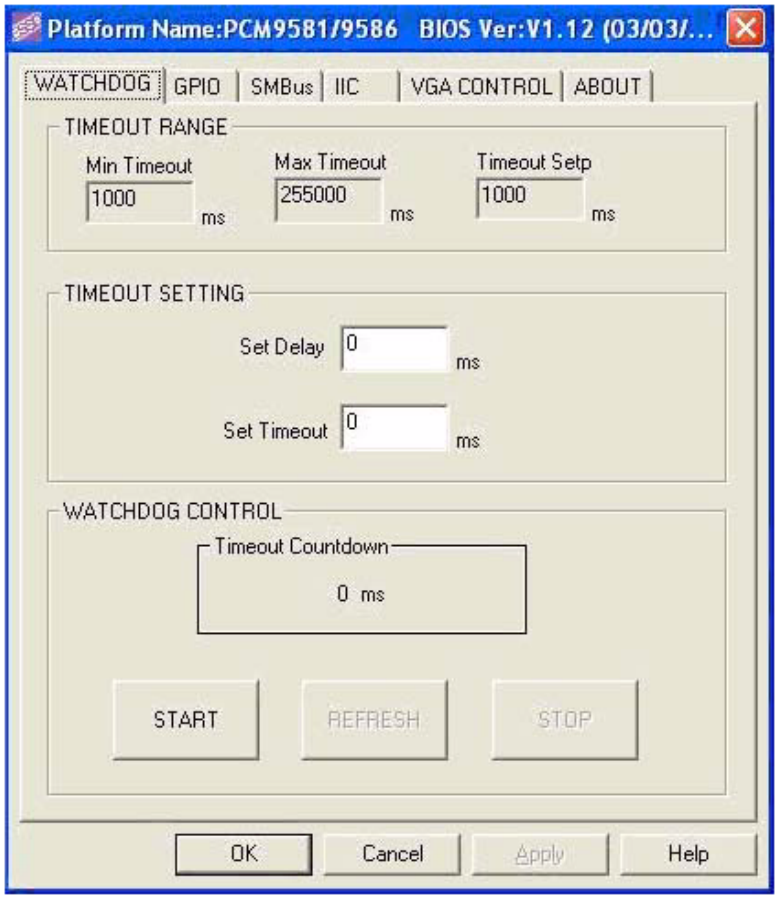
Windows Graphics Mode

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.

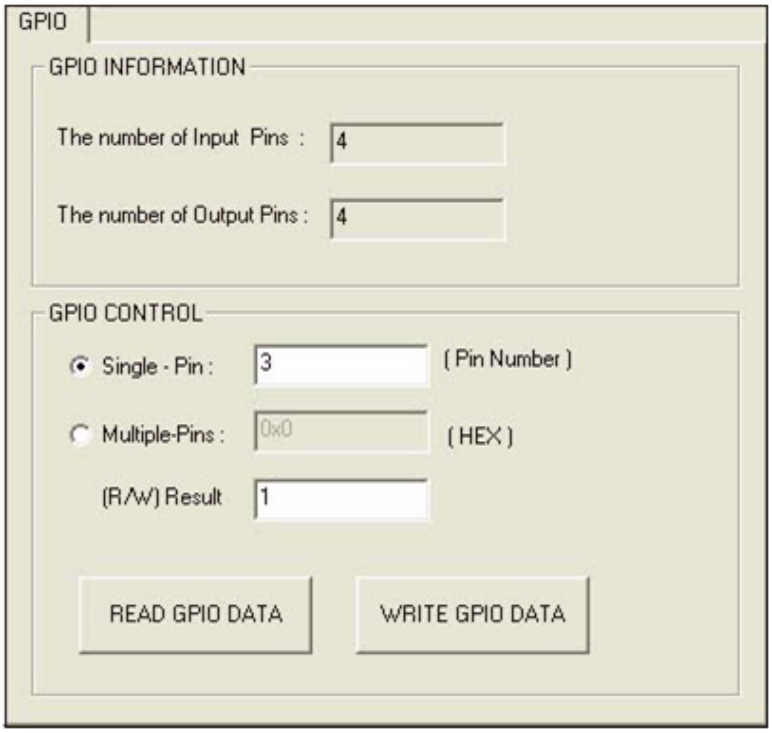
SusiDemo.exe is an executable file and it requires the shared library, Susi.dll, to demonstrate the SUSI functions. The source code of SusiDemo.exe also has two versions, i. Windows CE and Windows XP, and must be compiled under Microsoft Visual C++ 6.0 on Windows XP or under Microsoft Embedded Visual 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 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

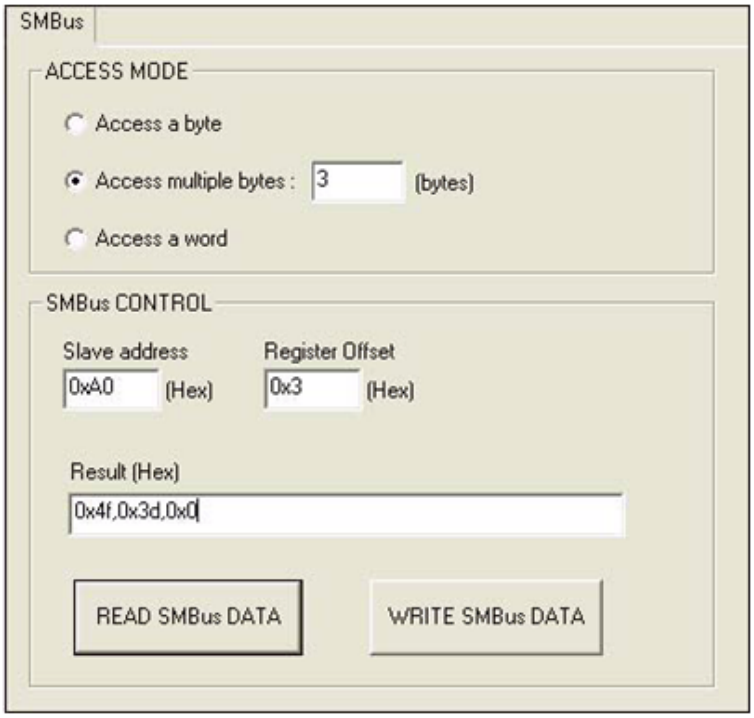


When the application is executed, it will display GPIO information in the GPIO INFORMATION group box. It displays the number of input pins and output pins. You can click the radio button to choose to test either the single pin function or multiple pin functions. The GPIO pin assignments of the supported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

SMBus

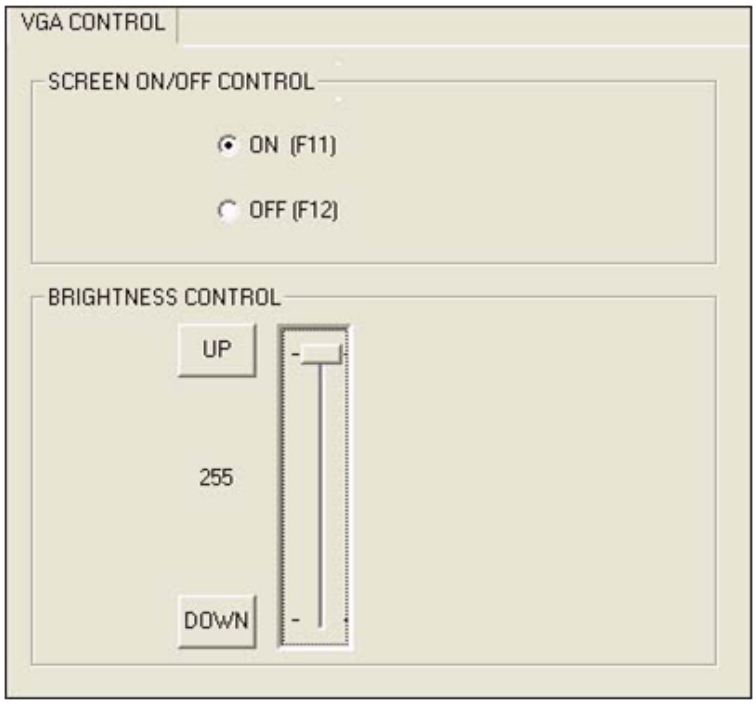


When the application has executed, you can click the radio button to choose to test each access mode, i.e. Access a byte, Access multiple bytes and Access a word. All data must be read or written in hexadecimal except the numbers for radio button: Access multiple bytes mode must be written in decimal.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

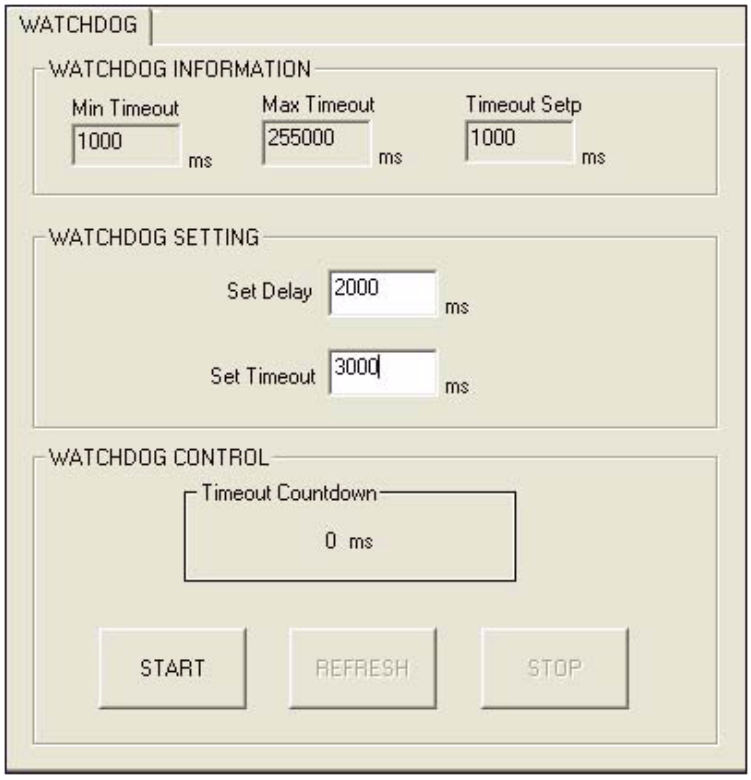
Display Control



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 functionality 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.

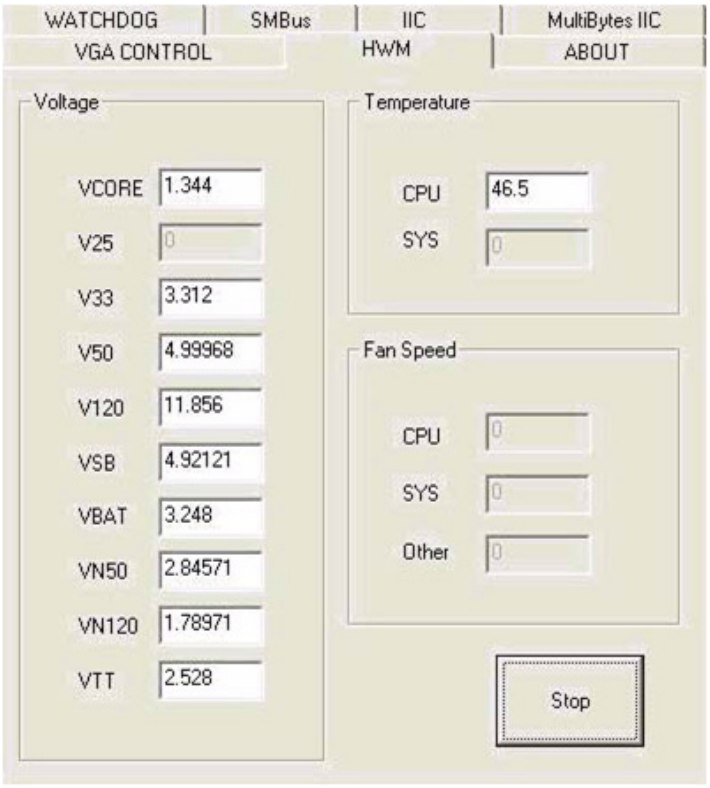
Watchdog



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 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.

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 a more detailed PCM-3356 software API user manual, please contact your dealer or Advantech AE. We also include these manuals on the bundled CD.

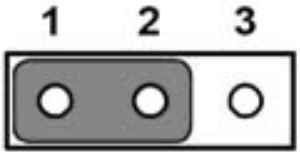
Appendix A

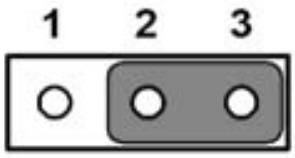
Pin Assignments

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

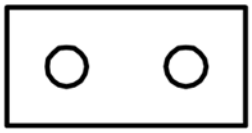
- Jumper and Connector Tables

A.1 Jumper and Connector Tables

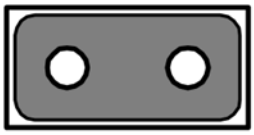




J1	LCD Power
Part Number	1653003101
Footprint	HD_3x1P_79_D
Description	PIN HEADER 3x1P 2.0mm 180D(M) DIP 2000-13 WS
Setting	Function
(1-2)	+5V
(2-3)*	+3.3V

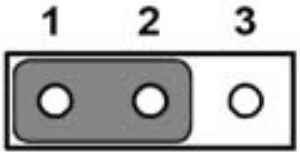


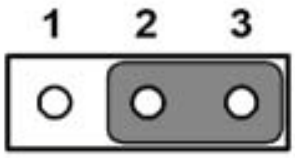
open



closed

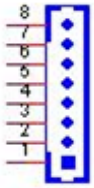
J2	Auto Power On Setting
Part Number	1653002101
Footprint	HD_2x1P_79_D
Description	PIN HEADER 2*1P 180D(M)SQUARE 2.0mm DIP W/O Pb
Setting	Function
NC	Power Button for Power On
(1-2)*	Auto Power On





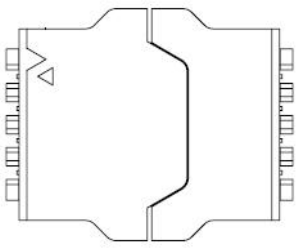
J3	Clear CMOS
Part Number	1653003101
Footprint	HD_3x1P_79_D
Description	PIN HEADER 3x1P 2.0mm 180D(M) DIP 2000-13 WS
Setting	Function
(1-2)*	Normal
(2-3)	Clear COMS

CN1	Power Input
Part Number	1655308020
Footprint	WHL8V-2M
Description	Wafer Box 2.0mm 8P 180D(M) W/Lock 2001-WS-8
Pin	Pin Name
1	+5V
2	+5V
3	+5V
4	GND
5	GND
6	GND
7	GND
8	+12V

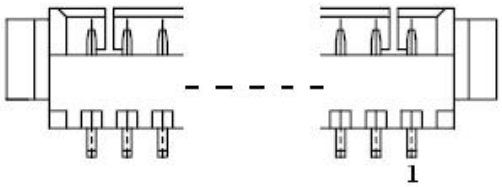


CN2	SODIMMDDR3_204
Part Number	1651002087
Footprint	DDR3_204P_AS0A626-N2S6-7H
Description	
Pin	Pin Name

CN3	BIOS Socket
Part Number	1651000682
Footprint	SOCKET_8P_ACA-SPI-004-K01
Description	IC SKT 8P SMD 8P SMD ACA-SPI-004-K01
Pin	Pin Name
1	CE#
2	SO
3	WP#
4	GND
5	SI
6	SCK
7	HOLD#
8	+3.3V

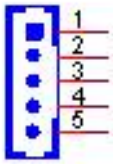


CN5	VGA
Part Number	1655912120
Footprint	SP-12SMH
Description	WAFER BOX 12P 1.25mm 90D(M) SMD 85204-12001
Pin	Pin Name
1	GND
2	RED
3	GREEN
4	BLUE
5	GND
6	NC
7	DDAT
8	DCLK
9	GND
10	HSYNC
11	VSYNC
12	GND

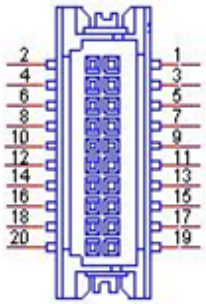


Matching Cable:1700000898

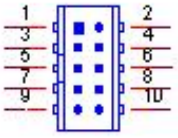
CN6	Inverter Power Output
Part Number	1655000453
Footprint	WHL5V-2M-24W1140
Description	WAFER BOX 2.0mm 5P 180D(M) DIP WO/Pb JIH VEI
Pin	Pin Name
1	+12V
2	GND
3	ENABKL
4	VBR
5	+5V



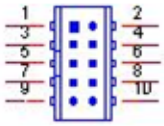
CN7	**18 bits LVDS Panel**
Part Number	**1653910261**
Footprint	**SPH10X2**
Description	B/B Conn 10x2P 1.25mm 180D(M)SMD DF13-20DP-1.25V
Pin	Pin Name
1	GND
2	GND
3	LVDS0_D0+
4	NC
5	LVDS0_D0-
6	NC
7	LVDS0_D1+
8	NC
9	LVDS0_D1-
10	NC
11	LVDS0_D2+
12	NC
13	LVDS0_D2-
14	NC
15	LVDS0_CLK+
16	NC
17	LVDS0_CLK-
18	NC
19	+5V or +3.3V
20	+5V or +3.3V



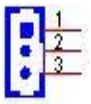
CN8	LAN
Part Number	1653004099
Footprint	HD_5x2P_79_23N685B-10M10
Description	BOX HEADER 5x2P 2.00mm 180D(M) SMD 23N685B-10M10
Pin	Pin Name
1	GND
2	GND
3	BI_DD+(GHz)
4	BI_DD-(GHz)
5	BI_DC+(GHz)
6	BI_DC-(GHz)
7	RX+(10/100),BI_DB+(GHz)
8	RX-(10/100),BI_DB-(GHz)
9	TX+(10/100),BI_DA+(GHz)
10	TX-(10/100),BI_DA-(GHz)



CN9	LAN
Part Number	1653004099
Footprint	HD_5x2P_79_23N685B-10M10
Description	BOX HEADER 5x2P 2.00mm 180D(M) SMD 23N685B-10M10
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)



CN10	Audio
Part Number	1655303020
Footprint	WHL3V-2M
Description	WAFER BOX 3P 2.0mm 180D(M) DIP 2001-WS-3
Pin	Pin Name
1	LOUTR
2	GND
3	LOUTL



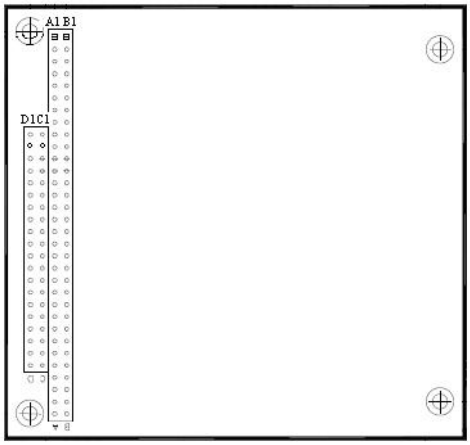
CN11	Buzzer
Part Number	1655902032
Footprint	WHL2V-125
Description	WAFER BOX 2P 1.25mm 180D(M) DIP 53047-0210
Pin	Pin Name
1	Buzzer+
2	Buzzer-

Matching Cable: 1750005282

CN12	ISA
Part Number	00A0000005 165313222B 165312022B
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

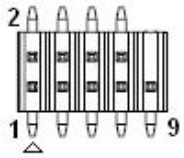
A17	SA14
A18	SA13
A19	SA12
A20	SA11
A21	SA10
A22	SA9
A23	SA8
A24	SA7
A25	SA6
A26	SA5
A27	SA4
A28	SA3
A29	SA2
A30	SA1
A31	SA0
A32	GND
B1	GND
B2	RSTDRV
B3	+5V
B4	IRQ9
B5	-5V
B6	DRQ2
B7	-12V
B8	0WS#
B9	+12V
B10	GND
B11	SMEMW#
B12	SMEMR#
B13	IOW#
B14	IOR#
B15	DACK3#
B16	DRQ3
B17	DACK1#
B18	DRQ1
B19	REFRESH#
B20	SYSCLK
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
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	+5V
D18	MASTER#
D19	GND
D20	GND



CN13	ISA -5V & -12V Input
Part Number	1653003101
Footprint	HD_3x1P_79_D
Description	PIN HEADER 3x1P 2.0mm 180D(M) DIP 2000-13 WS
Pin	Pin Name
1	-5V
2	GND
3	-12V

CN14	Internal USB
Part Number	1653005260
Footprint	HD_5x2P_79_N10
Description	PIN HEADER 2x5P 2.0mm 180D(M) SMD 21N22050
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

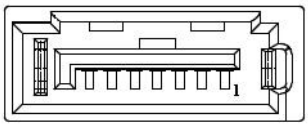


Matching Cable: 1703100260 1703100121

CN15	**mSATA**
Part Number	00A00000770
Footprint	MINIPCIE_HALF_PICO_ITX
Description	
Pin	Pin Name
1	NC
2	+3.3V
3	NC
4	GND
5	NC
6	+1.5V
7	NC
8	NC
9	GND
10	NC
11	NC
12	NC
13	NC
14	NC
15	GND
16	NC
17	NC
18	GND
19	NC
20	NC
21	GND
22	NC
23	B+
24	+3.3V
25	B-
26	GND
27	GND
28	+1.5V
29	GND
30	SMB_CLK
31	A-
32	SMB_DAT
33	A+
34	GND
35	GND
36	USB D-
37	GND
38	USB D+
39	+3.3V
40	GND
41	+3.3V
42	NC

43	NC
44	NC
45	NC
46	NC
47	NC
48	+1.5V
49	NC
50	GND
51	NC
52	+3.3V

CN16	**SATA**
Part Number	1654007578
Footprint	SATA_7P_WATF-07DBN6SB1U
Description	Serial ATA 7P 1.27mm 180D(M) SMD WATF-07DBN6SB1U
Pin	Pin Name
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND



CN17	**SATA Power**
Part Number	1655302020
Footprint	WF_2P_79_BOX_R1_D
Description	WAFER BOX 2P 2.0mm 180D(M) DIP A2001WV2-2P
Pin	Pin Name
1	+5V
2	GND

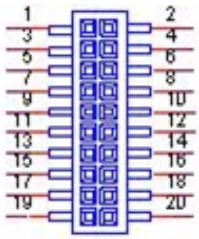
CN18	Front Panel
Part Number	1653008101
Footprint	JH8X1V-2M
Description	PIN HEADER 8x1P 2.0mm 180D(M) DIP 209-1*8GS
Pin	Pin Name
1	Power Button Pin1
2	Power Button Pin2
3	Reset Button Pin1
4	Reset Button Pin2
5	Power LED+
6	Power LED-
7	HDD LED+
8	HDD LED-

CN19	Mini PCIE
Part Number	00A00000660
Footprint	MINIPCIE_HALF_PICO2600
Description	
Pin	Pin Name
1	WAKE#
2	+3.3VSB
3	NC
4	GND
5	NC
6	+1.5V
7	NC
8	NC
9	GND
10	NC
11	REFCLK-
12	NC
13	REFCLK+
14	NC
15	GND
16	NC
17	NC
18	GND
19	NC
20	NC
21	GND

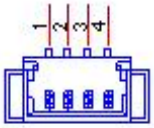
22	PERST#
23	PERn0
24	+3.3VSB
25	PERp0
26	GND
27	GND
28	+1.5V
29	GND
30	SMB_CLK
31	PETn0
32	SMB_DAT
33	PETp0
34	GND
35	GND
36	USB D-
37	GND
38	USB D+
39	+3.3VSB
40	GND
41	+3.3VSB
42	NC
43	GND
44	NC
45	NC
46	NC
47	NC
48	+1.5V
49	NC
50	GND
51	NC
52	+3.3VSB

CN20	**COM1/COM2/RS422/RS485**
Part Number	1653004793
Footprint	HD_10x2P_79_23N685B-20M10
Description	BOX HEADER 10x2P 2.0mm 180D(M)SMD 23N685B-20M10B
Pin	Pin Name
1	422TX1-/485D1-/DCD1#
2	DSR1#
3	422TX1+/485D1+/RXD1
4	RTS1#
5	422RX1+/TXD1
6	CTS1#
7	422RX1-/DTR1#
8	RI1#
9	GND
10	GND
11	422TX2-/485D2-/DCD2#

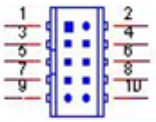
12	DSR2#
13	422TX2+/485D2+/RXD2
14	RTS2#
15	422RX2+/TXD2
16	CTS2#
17	422RX2-/DTR2#
18	RI2#
19	GND
20	GND



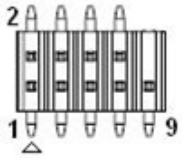
CN21	**SMBus**
Part Number	1655904020
Footprint	FPC4V-125M
Description	WAFER 4P 1.25mm 180D(M) SMD 85205-04001
Pin	Pin Name
1	GND
2	SMB_DAT
3	SMB_CLK
4	+5V



CN23	**COM3/RS422/RS485**
Part Number	1653004099
Footprint	HD_5x2P_79_23N685B-10M10
Description	BOX HEADER 5x2P 2.00mm 180D(M) SMD 23N685B-10M10
Pin	Pin Name
1	422TX-/485D-/DCD#
2	DSR#
3	422TX+/485D+/RXD
4	RTS#
5	422RX+/TXD
6	CTS#
7	422RX-/DTR#
8	RI#
9	GND
10	GND

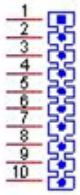


CN24	Internal USB
Part Number	1653005260
Footprint	HD_5x2P_79_N10
Description	PIN HEADER 2x5P 2.0mm 180D(M) SMD 21N22050
Pin	Pin Name
1	+5V
2	+5V
3	A_D-
4	B_D-
5	A_D+
6	B_D+
7	GND
8	GND
9	GND

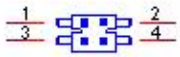


Matching Cable:1703100260 1703100121

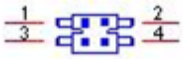
CN36	GPIO
Part Number	1653010102
Footprint	JH10X1V-2M
Description	PIN HEADER 10x1P 2.0mm 180D(M) DIP 209-1*10GS
Pin	Pin Name
1	+5V
2	GPIO0
3	GPIO1
4	GPIO2
5	GPIO3
6	GPIO4
7	GPIO5
8	GPIO6
9	GPIO7
10	GND



CN38	**LAN LED**
Part Number	1653000014
Footprint	HD_2x2P_79
Description	PIN HEADER 2x2P 2.00mm 180D(M) SMD 21N22050
Pin	Pin Name
1	LINK100#
2	+3.3V
3	ACT#
4	LINK1000#



CN39	LAN LED
Part Number	1653000014
Footprint	HD_2x2P_79
Description	PIN HEADER 2x2P 2.00mm 180D(M) SMD 21N22050
Pin	Pin Name
1	LINK100#
2	+3.3V
3	ACT#
4	LINK1000#



Appendix B

System Assignments

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

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

B.1 System I/O Ports

Table B.1: System I/O ports	
Addr. range (Hex)	**Device**
000-02F	DMA Controller
020-02D	Interrupt Controller
040-04F	System resource
050-052	Timer/Counter
060-06F	8042 (keyboard controller)
070-07F	Real-time clock, non-maskable interrupt (NMI) mask
080-09F	DMA page register
0A0-0FF	System resource
0C0-0DF	DMA controller
0F0-0FF	System resource
170-177	IDE Controller
1F0-1F7	IDE Controller
3C0-3DF	System resource
2F8-2FF	Serial port 2
3E8-3EF	Serial port 3
3F8-3FF	Serial port 1
400-4FF	System resource
800-8FF	System resource
B00-B3F	System resource
C00-CFF	System resource
E00-E7F	System resource

B.2 1st MB Memory Map

Table B.2: 1st MB memory map	
Addr. range (Hex)	**Device**
F0000h - FFFFFh	System ROM
D0000h - E7FFFh	Unused (reserved for Ethernet ROM)
C0000h - CFFFFh	Expansion ROM (for VGA BIOS)
B8000h - BFFFFh	CGA/EGA/VGA text
A0000h - B7FFFh	EGA/VGA graphics
00000h - 9FFFFh	Base memory

B.3 Interrupt assignments

Table B.3: Interrupt assignments

Interrupt#	Interrupt source
IRQ0	Interval timer
IRQ1	Keyboard
IRQ2	Interrupt from controller 2 (cascade)
IRQ3	COM2
IRQ4	COM1
IRQ5	Available
IRQ6	Reserved
IRQ7	COM3
IRQ8	RTC
IRQ9	Reserved
IRQ10	COM3
IRQ11	Available
IRQ12	Reserved
IRQ13	Math Coprocessor
IRQ14	Primary IDE
IRQ15	Secondary IDE

Appendix C

Watchdog Timer Sample Code

C.1 Watchdog Timer Sample Code

```
;The SCH3114 Runtime base I/O address is E00h
;Setting WatchDog time value location at offset 66h
;If set value "0", it is mean disable WatchDog function.
Superio_GPIO_Port = E00h
mov dx,Superio_GPIO_Port + 66h
mov al,00h
out dx,al
.model small
.486p
.stack 256
.data
SCH3114_IO EQU E00h
.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
```

ADVANTECH

Enabling an Intelligent Planet

www.advantech.com

Please verify specifications before quoting. This guide is intended for reference purposes only.

All product specifications are subject to change without notice.

No part of this publication may be reproduced in any form or by any means, electronic, photocopying, recording or otherwise, without prior written permission of the publisher.

All brand and product names are trademarks or registered trademarks of their respective companies.

© Advantech Co., Ltd. 2013