AMB-VDX3H1 Series

An ISA Half-Size Board with DM&P Vortex86DX3 CPU

- ***AMB-VDX3H1***
  (1GHz/1GB Memory, 2x RS232, 2x RS232/RS422/RS485)
- ***AMB-VDX3H1A***
  (1GHz/1GB Memory, 2x RS232)
- ***AMB-VDX3H1B***
  (1GHz/512MB Memory, 2x RS232, 2x RS232/RS422/RS485)
- ***AMB-VDX3H1C***
  (1GHz/512MB Memory, 2x RS232)
- ***AMB-VDX3H1A1***
  (600MHz/1GB Memory, 2x RS232)
- ***AMB-VDX3H1B1***
  (600MHz/512MB Memory, 2x RS232, 2x RS232/RS422/RS485)
- ***AMB-VDX3H1C1***
  (600MHz/512MB Memory, 2x RS232)

User Manual

Acrosser Technology Co., Ltd.
www.acrosser.com

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Purpose

This document is intended to provide the information about the features and use of the product.

Audience

The intended audiences are technical personnel, not for general audiences.

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Date: Jul. 7, 2019

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Table of Contents

1. Introduction

AMB-VDX3H1 Series is an ISA half-size board with DM&P Vortex86DX3 Dual Core CPU, the best choice of ISA card for industrial SBC of factory automation environment.

1.1. Models

This manual is applied to the following models:

1. AMB-VDX3H1
2. AMB-VDX3H1A
3. AMB-VDX3H1B
4. AMB-VDX3H1C
5. AMB-VDX3H1A1
6. AMB-VDX3H1B1
7. AMB-VDX3H1C1

1.2. Specifications

General

CPU	• DM&P Vortex86DX3
Memory	• Onboard DDR3 1GB (AMB-VDX3H1, AMB-VDX3H1A, AMB-VDX3H1A1) • Onboard DDR3 512MB (AMB-VDX3H1B, AMB-VDX3H1B1, AMB-VDX3H1C, AMB-VDX3H1C1)
BIOS	• Onboard SPI Flash
Real Time Clock	• 1x System RTC
Battery	• 1x Lithium Battery, 3V 220mAH (CR2032)

Video

Graphic Controller	• Integrated
Video Interface	• 1x VGA

Storage

IDE	• 1x IDE
CF	• 1x CF
SATA	• 1x SATA Connector & SATA Power Connector

Communication and I/O

Expansion	• 1x PC/104 Connector
ISA	• 1x ISA Gold Finger
Ethernet	• 1x RJ45 10/100Mbps LAN
Serial Ports	• 2x RS-232 (COM1=DB9, COM2=Pin Header) • 2x RS-232/422/485 (Jumper Select) (COM3~4)
USB Ports	• 4x USB 2.0
GPIO	• 16 bit GPIO (1~8 = Header 1, 9~16 = Header 2)
Parallel Port	• 1x Print Port
I2C	• 1x I2C Pin
Keyboard/Mouse	• 1x PS/2 Connector • 1x JST Pin Header * There is only one type can be worked at the same time.
Indicator	• Power LED • HDD LED

Hardware Features

Watchdog Timer	• Software Programmable 0 ~ 255 Seconds, (0=disable timer)
Buzzer	• 1x Onboard

Power Requirement

Power Input	• ISA Edge Finger or 4Pin ATX Peripheral Power Connector

Software

OS support	• DOS • Windows XP (32 bit) • Windows 7 (32 bit) (Only support AMB-VDX3H1A, AMB-VDX3H1A1) • Win CE 6.0(32 bit), Optional

Mechanical & Environment

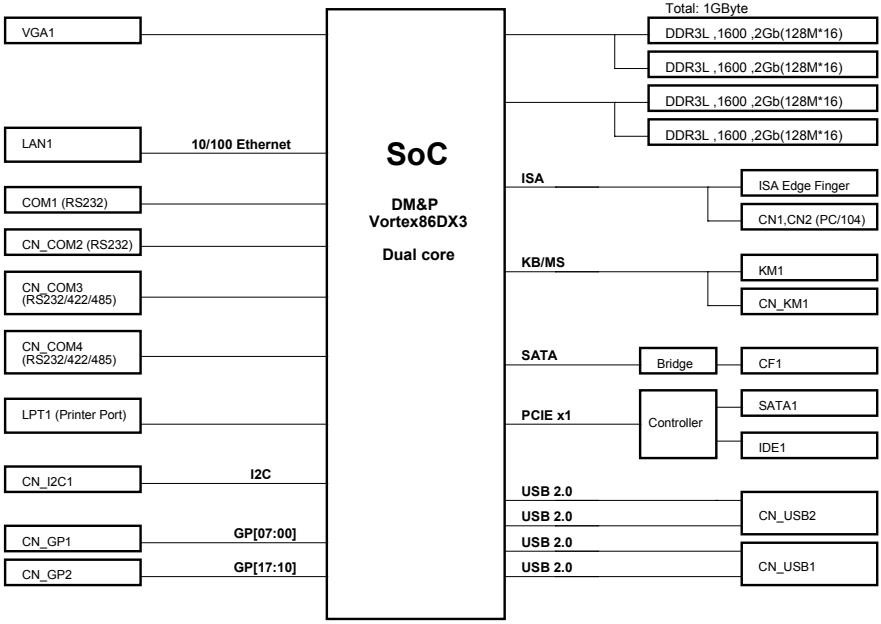
Dimension	• 185mm x 122mm (7.29” x 4.81”)
Operating Temp.	• 0 ~ 60°C (32 ~ 140°F) • CPU Heatsink Temp. < 70°C
Storage Temp.	• -20 ~ 80°C (-4 ~ 176°F)
Relative Humidity	• 0 ~ 90% @ 40°C, non-condensing
Safety	• CE, FCC Class A

1.3. Packing List

Check if the following items are included in the package.

	Item	Q’ty
☐	AMB-VDX3H1 Series Board	1
☐	Quick Guide	1
☐	Utility CD	1

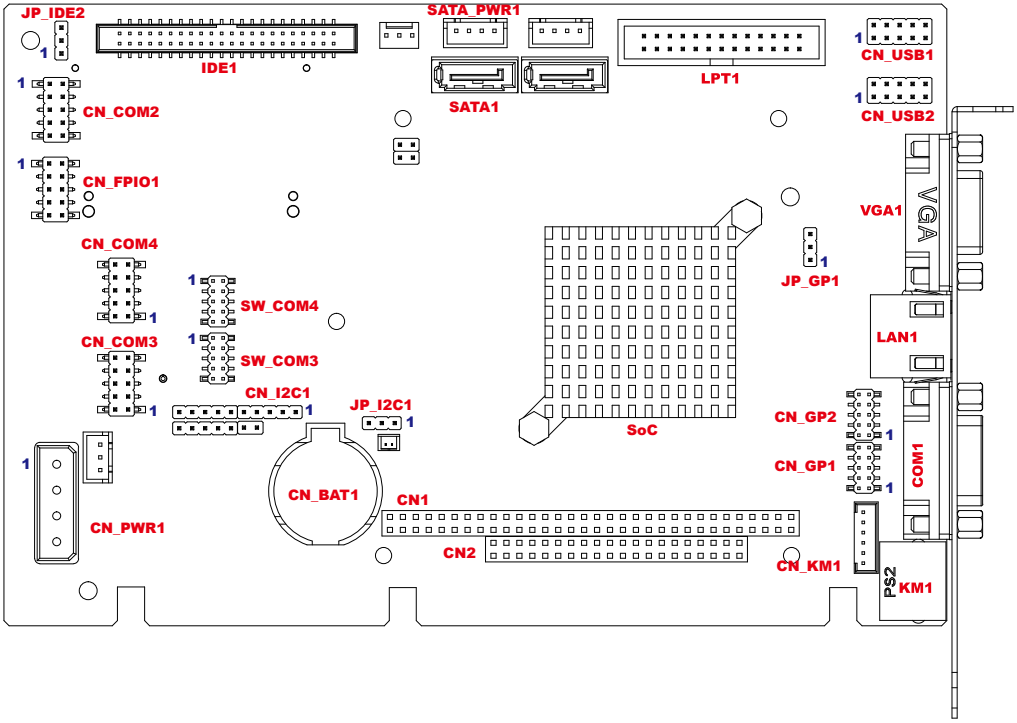
1.4. Block Diagram



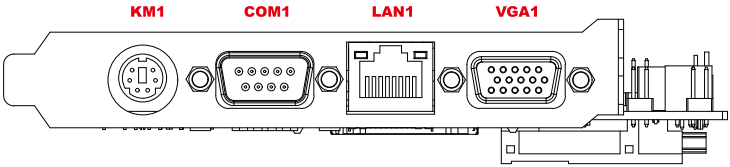
2. Hardware Information

2.1. Mainboard Layout

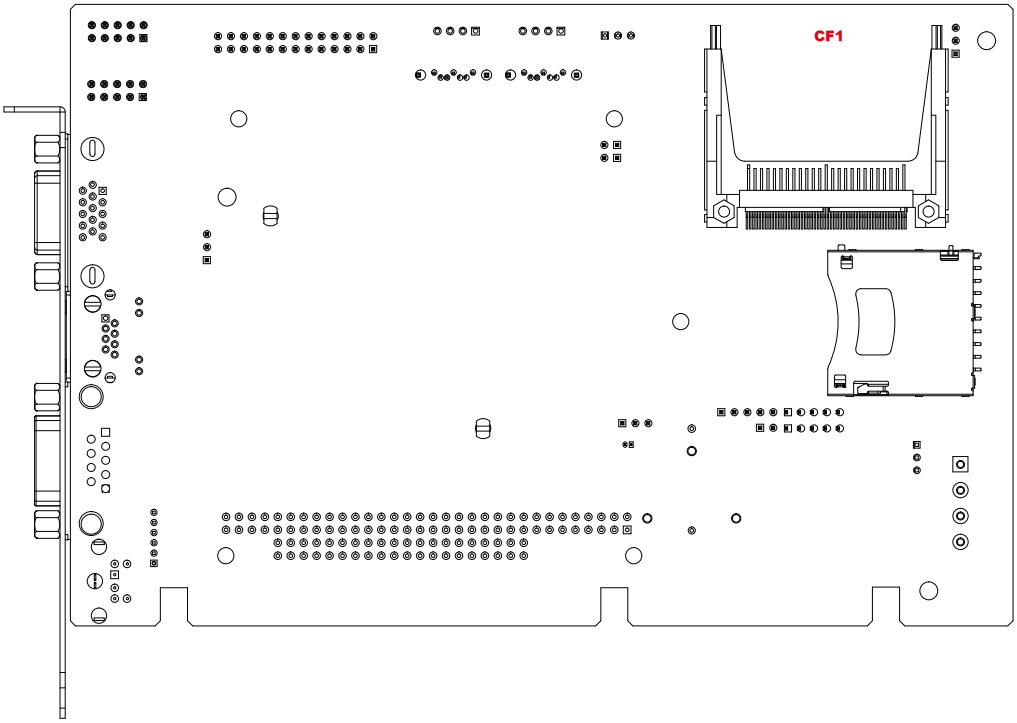
2.1.1. Top View



2.1.2. IO View

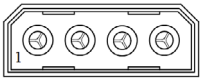


2.1.3. Bottom View



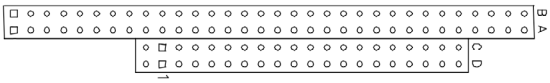
2.2. Connector and Jumper Pin Definition

CN_PWR1 — **ATX Power Input**

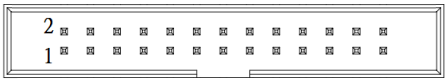


Pin #	Signal
1	+5V (4A)
2	GND
3	GND
4	+12V (1.2A)

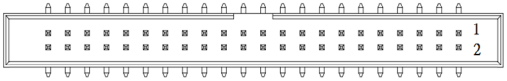
CN1
CN2 — **Standard PC/104 Module Connector**



LPT1 — **Standard Parallel 26-pin Connector**



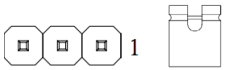
IDE1 — **Standard IDE 44-pin Connector**



PS: Pin 41, 42: +5V/1.5A max

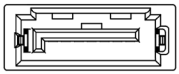
Note: *The jumper selection of HDD,SSD or ODD should be "Master".*

JP_IDE2 — **IDE1 Vcc Jumper Setting: (Pitch: 2.54mm)**

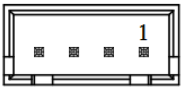


Short	Function
1-2	+5V / 1.5A (default for HDD)
2-3	+3.3V / 1.5A

SATA1 — **Standard SATA 7-pin Connector**

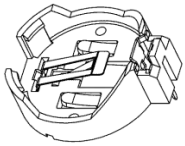


SATA_PWR1 **SATA Power Cable Connector (Pitch:2.54mm)**

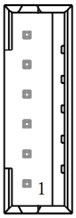


Pin #	Signal
1	+12V
2	GND
3	+3.3V
4	+5V

CN_BAT1 **CR2032 Battery Holder**

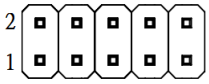


CN_KM1 **KB/MS Cable Connector: (Pitch: 2mm)**



Pin #	Signal
1	MS DAT
2	KB DAT
3	GND
4	+5V
5	MS CLK
6	KB CLK

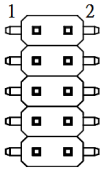
CN_USB1
CN_USB2 **USB 2.0 Cable Connector (Pitch: 2.54mm)**



Pin #	Signal	Pin #	Signal
1	+5V	2	+5V
3	USB Port A -	4	USB Port B -
5	USB Port A +	6	USB Port B +
7	GND	8	GND
9	NC	10	NC

CN_COM2

RS-232 Port Connector: (Pitch: 2.54mm)



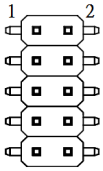
Pin #	Signal	Pin #	Signal
1	DCD	2	DSR
3	RxD	4	RTS
5	TxD	6	CTS
7	DTR	8	RI
9	GND	10	NC

CN_COM3
CN_COM4

RS-232/422/485 Port Multi-protocol Connector: (Pitch: 2.54mm)

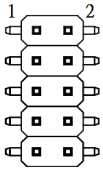
Note: RTS is the TX enable signal of RS-485. RS-485 will have output only when RTS is Low.

RS-232 Mode (SW_COM3/4 must set 001)



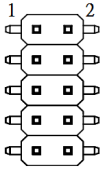
Pin #	Signal	Pin #	Signal
1	DCD	2	DSR
3	RxD	4	RTS
5	TxD	6	CTS
7	DTR	8	RI
9	GND	10	NC

RS-422 Mode (SW_COM3/4 must set 000 or 100)



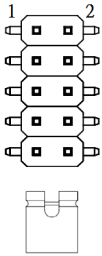
Pin #	Signal	Pin #	Signal
1	TX(B)	2	
3	TX(A)	4	
5	RX(A)	6	
7	RX(B)	8	
9	GND	10	

RS-485 Mode (SW_COM3/4 must set 010 or 110)



Pin #	Signal	Pin #	Signal
1	D- (B)	2	
3	D+ (A)	4	
5		6	
7		8	
9	GND	10	

SW_COM3
SW_COM4



CN_COM3 & CN_COM4 Jumper Setting (Pitch: 2mm)

Mode	Pin 9-10	Pin 7-8	Pin 5-6	Pin 3-4	Pin 1-2	Mode Description
000	Open	Open	Short	Short	Short	RS422 Full Duplex
001	Open	Open	Short	Short	Open	RS232 Pure
010	Open	Open	Short	Open	Short	RS485 Half Duplex (TXEN#)
100	Open	Open	Open	Short	Short	RS422 Full Duplex w/ termination
101	Open	Open	Open	Short	Open	Reserved
110	Open	Open	Open	Open	Short	RS485 Half Duplex w/ termination (TXEN#)
111	Open	Open	Open	Open	Open	Reserved

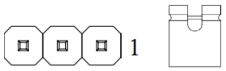
CN_I2C1

I2C Cable Connector (Pitch: 2.54mm)

Pin #	Signal
1	Vcc Setting by JP_I2C1
2	DAT
3	CLK
4	NC
5	GND

JP_I2C1

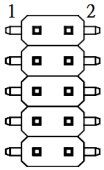
CN_I2C1 Vcc Jumper Setting: (Pitch: 2.54mm)



Short	Function
1-2	+3.3V / 1.5A (default)
2-3	+5V / 1.5A

CN_GP1
CN_GP2

16bits GPIO Cable Connector (Pitch: 2mm)

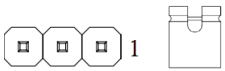


Pin #	Signal	Pin #	Signal
1	GP00 / GP10	2	GP07 / GP17
3	GP01 / GP11	4	GP06 / GP16
5	GP02 / GP12	6	GP05 / GP15
7	GP03 / GP13	8	GP04 / GP14
9	GND	10	Vcc setting by JP_GP1

Note 1: w/o protection & isolation.
Note 2: 3.3V w/ 5V I/O tolerant.

JP_GP1

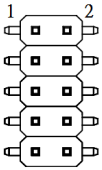
CN_GP1 & CN_GP2 Vcc Jumper Setting: (Pitch: 2.54mm)



Short	Function
1-2	+3.3V / 1.5A (default)
2-3	+5V / 1.5A

CN_FPIO1

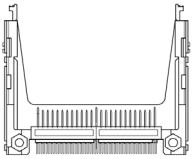
Power/HDD LED & Reset Button Cable Connector (Pitch: 2.54mm)



Pin #	Signal	Pin #	Signal
1	HDD LED+	2	Power LED+
3	HDD LED-	4	Power LED-
5	Reset SW+	6	NC
7	Reset SW-	8	NC
9	NC	10	NC

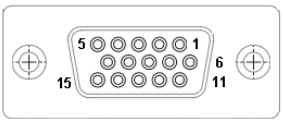
CF1

Standard CF Memory Card Connector



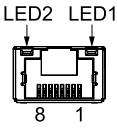
VGA1

Standard VGA (D-Sub15 / Female) Connector



LAN1

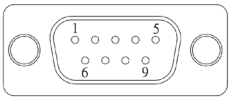
Standard IEEE802.3 & RJ45 Connector



LED		10Mbps	100Mbps
LED1	Link	Green	Green
LED2	Active	Yellow Blinking	Yellow Blinking

COM1

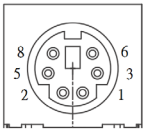
Standard RS232/DTE (D-Sub9 / Male) Connector



Pin #	Signal	Pin #	Signal
1	DCD	2	RX
3	TX	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI		

KM1

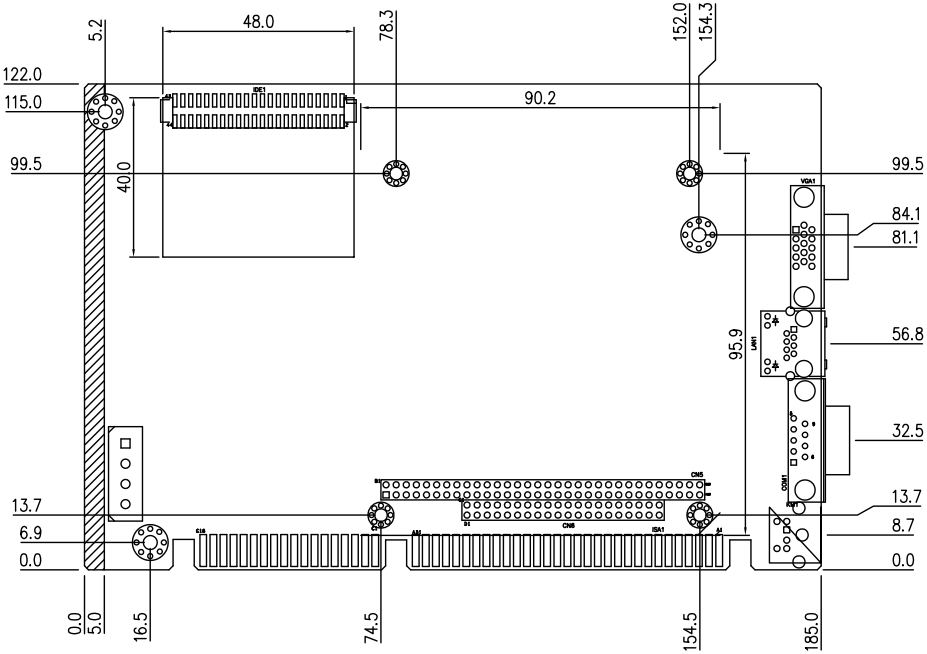
PS/2 Keyboard & Mouse Mixed Connector

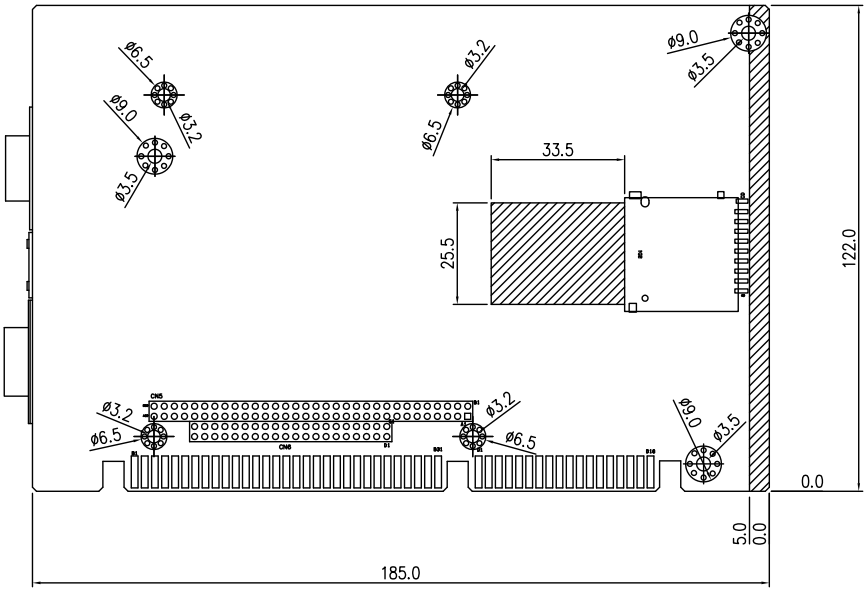


Pin #	Signal	Pin #	Signal
1	KB_DAT	2	MS_DAT
3	GND	5	+5V
6	KB_CLK	8	MS_CLK

2.3. Board Dimension

(Unit: mm)



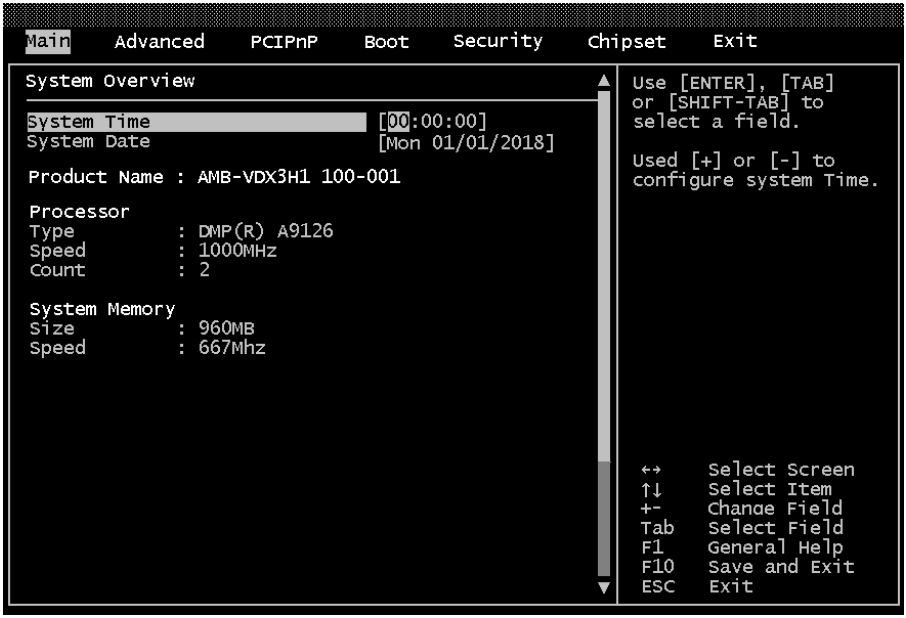


3. BIOS Settings

This chapter describes the BIOS menu displays and explains how to perform common tasks needed to get the system up. It also gives detailed explanation of the elements found in each of the BIOS menus. The following topics are covered:

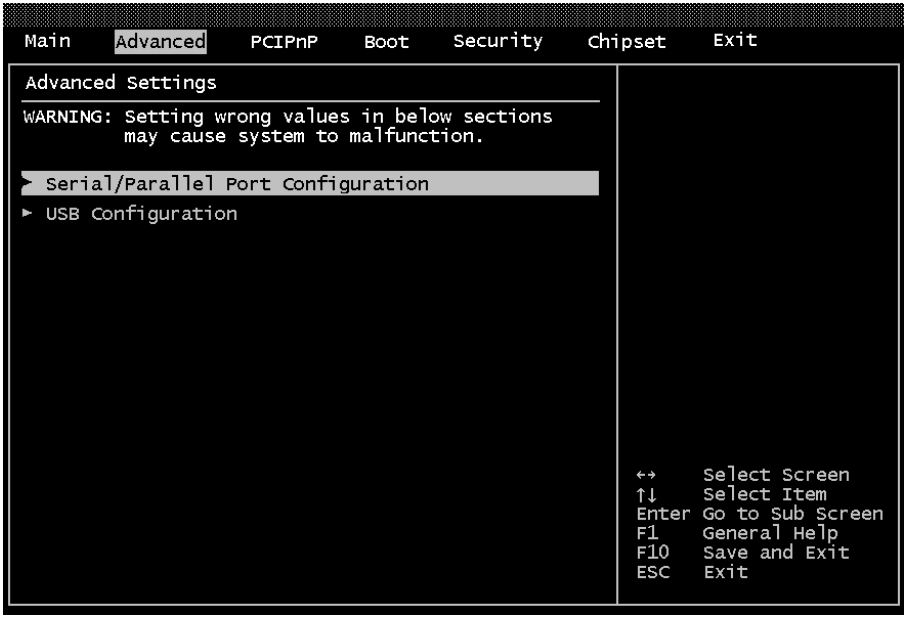
- Main Setup
- Advanced Setup
- PCIPnP Setup
- Boot Setup
- Security Setup
- Chipset Setup
- Exit Setup

3.1. Main Setup

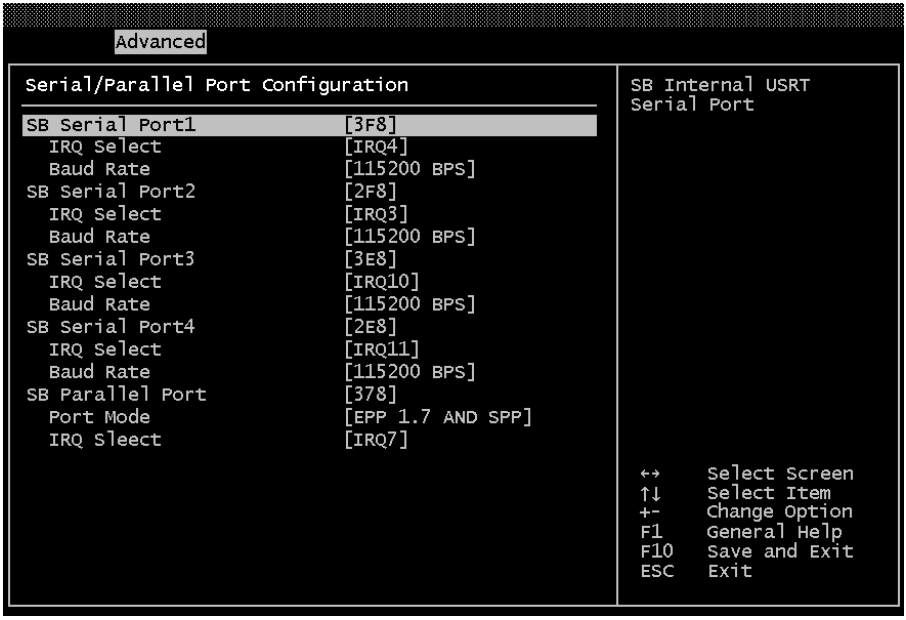


- **System Time**
  Set the system time. Use [ENTER], [TAB], or [SHIFT-TAB] to select a field. Use [+] or [-] to configure system time.
- **System Date**
  Set the system date. Use [ENTER], [TAB], or [SHIFT-TAB] to select a field. Use [+] or [-] to configure system date.

3.2. Advanced Setup



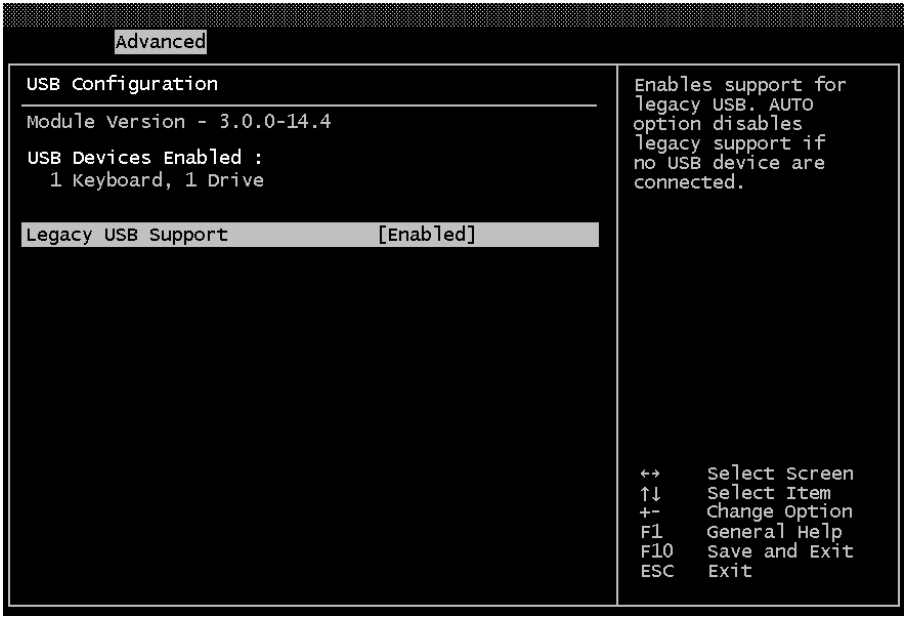
3.2.1. Serial/Parellel Port Configuration



These options specify the serial port address and the parallel port mode and select the IRQ of Serial/Parallel Port.

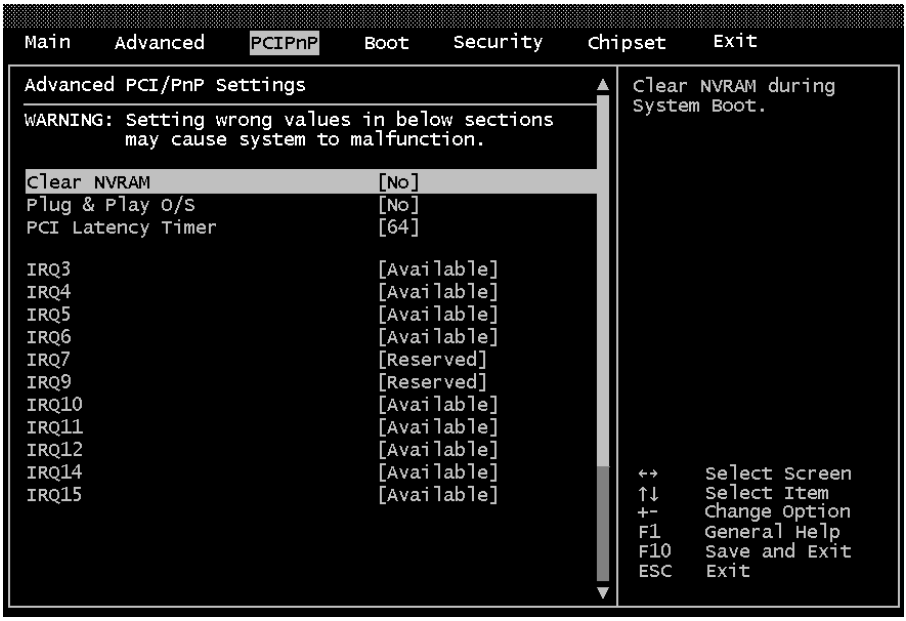
- **SB Serial Port1 ~ Port4**
  SB Internal UART Serial Port.
- **IRQ Select**
  SB Internal UART Serial Port. Serial Port IRQ Select.
- **Baud Rate**
  SB Internal UART Serial Port. Serial Port Baud Rtae Settings.
- **Port Mode**
  Allows BIOS to Select Parallel Port mode.
- **IRQ Select**
  Allows BIOS to Select Parallel Port IRQ.

3.2.2. USB Configuration



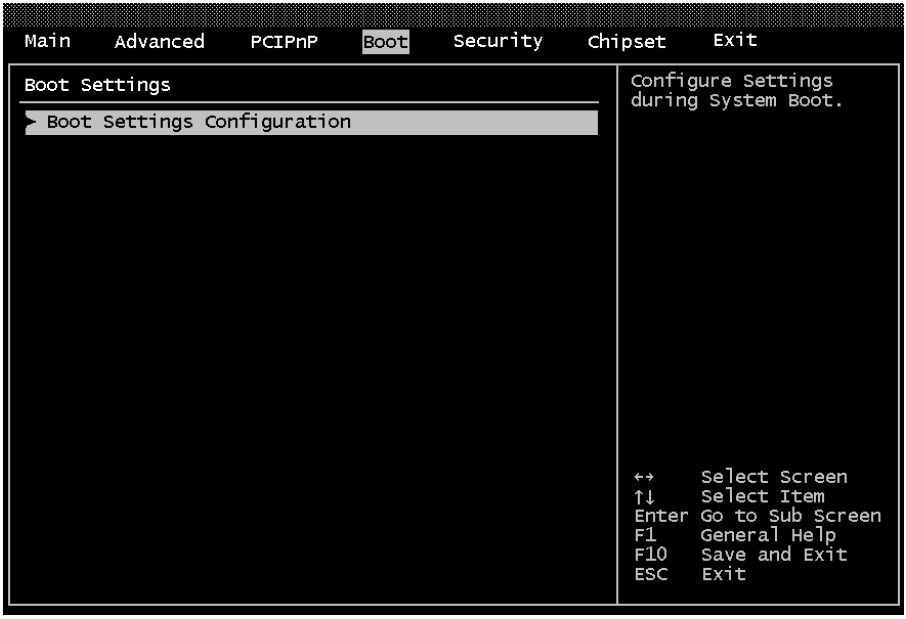
- **Legacy USB Support**
  Enables support for Legacy USB. Auto options disables legacy support if no USB devices are connected.

3.3. PCIPnP Setup

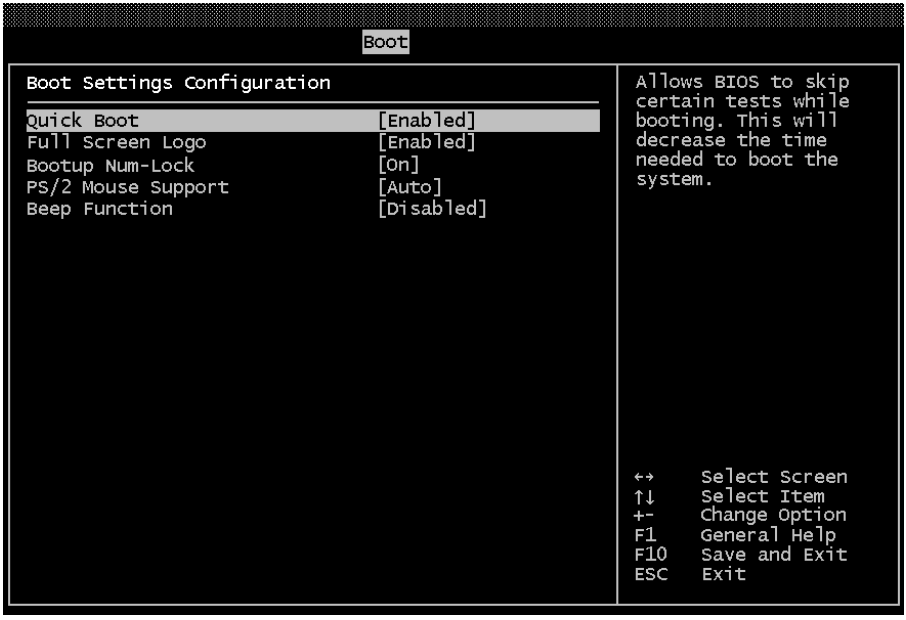


- **Clear NVRAM**
  Clear NVRAM during system boot.
- **Plug & Play O/S**
  No: Lets the BIOS configure all the devices in the system.
  Yes: Lets the operating system configure Plug & Play (PnP) devices not required for boot if your system has a Plug & Play operating system.
- **PCI Latency Timer**
  Allow you to select the value in units of PCI clocks for all of the PCI device latency timer register. Configuration option: 32, 64, 96, 128, 160, 192, 224, 248.
- **IRQ**
  Available: The specified IRQ is available to be used by PCI/PnP devices.
  Reserved: The specified IRQ is reserved for use by legacy ISA devices.

3.4. Boot Setup



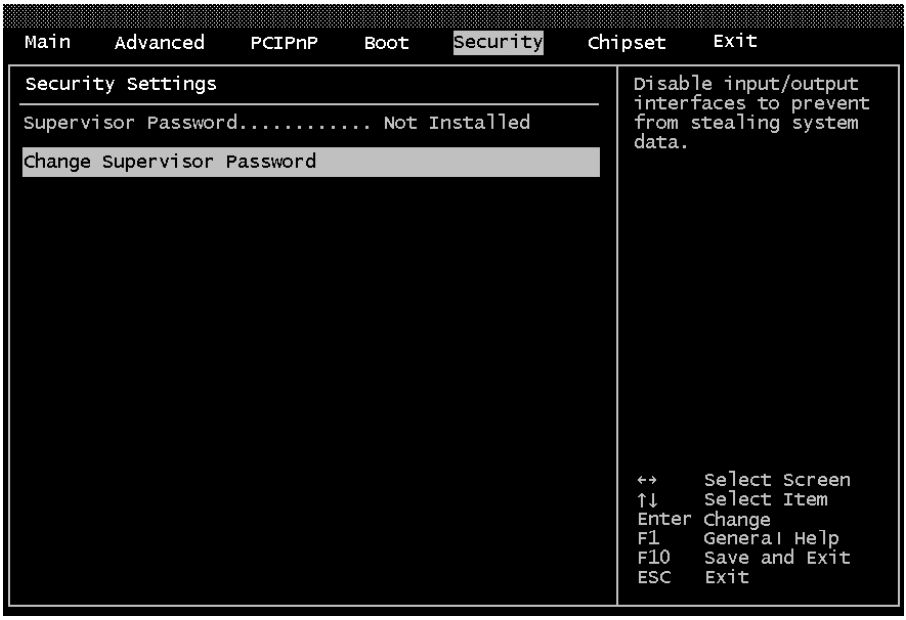
3.4.1. Boot Settings Configuration



- **Quick Boot**
  Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
- **Full Screen Logo**
  Disabled: Displays normal POST messages.
  Enabled: Displays OEM Logo instead of POST messages.
- **Boot-up Num-Lock**
  Select Power-on state for Numlock.
- **PS/2 Mouse Support**
  Select support for PS/2 mouse.
- **Beep Function**
  Enable or Disable beep function.

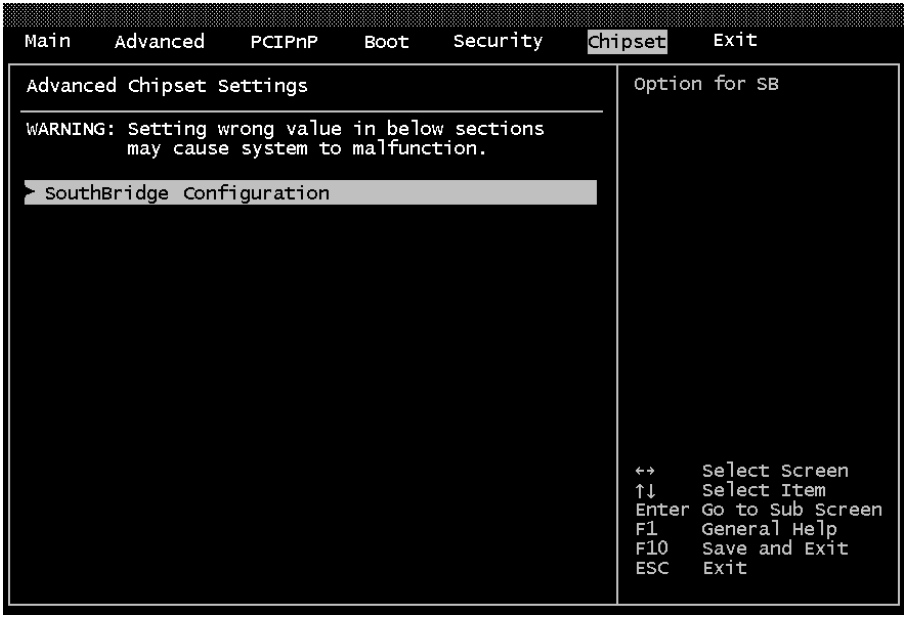
3.5. Security Setup

The Security menu items allow you to change the system security settings. Select an item then press <Enter> key to display the configuration options.

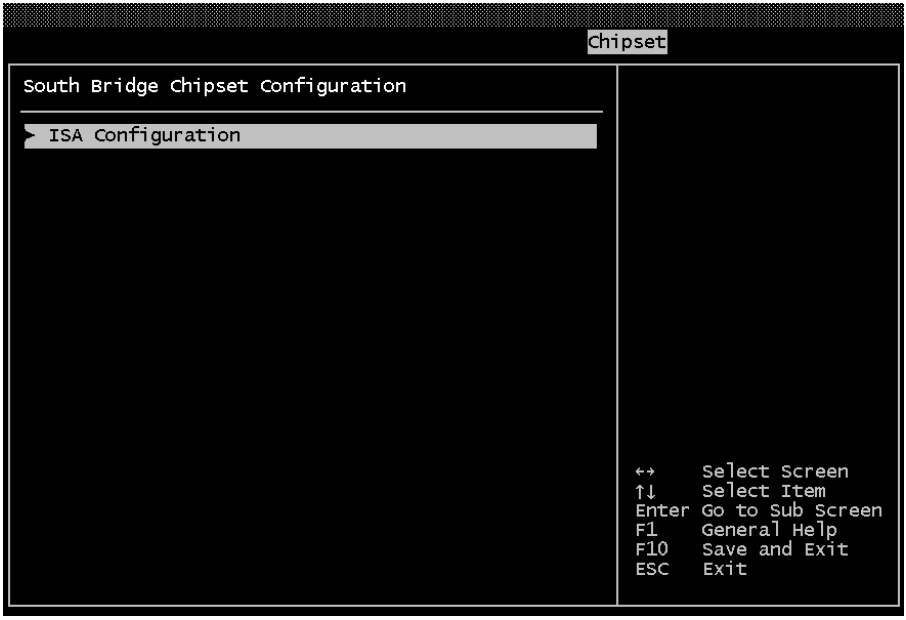


- **Supervisor Password**
  Indicate whether a supervisor password has been set. If the password has been installed, ***Installed*** displays. If not, ***Not Installed*** displays.
- **Change Supervisor Password**
  Install or change the password.

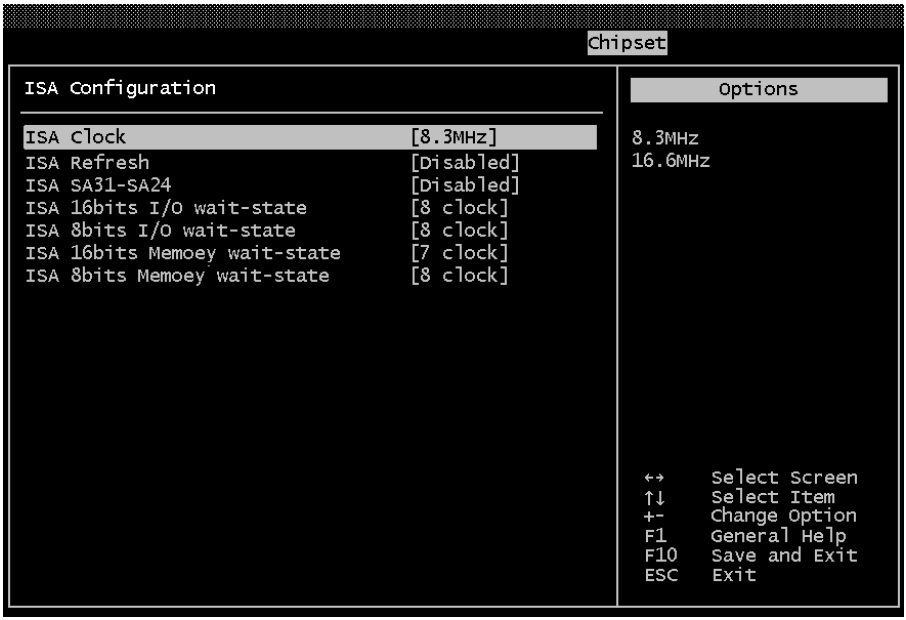
3.6. Chipset Setup



- **SouthBridge Configuration**
  Select options for the South Bridge Configuration.

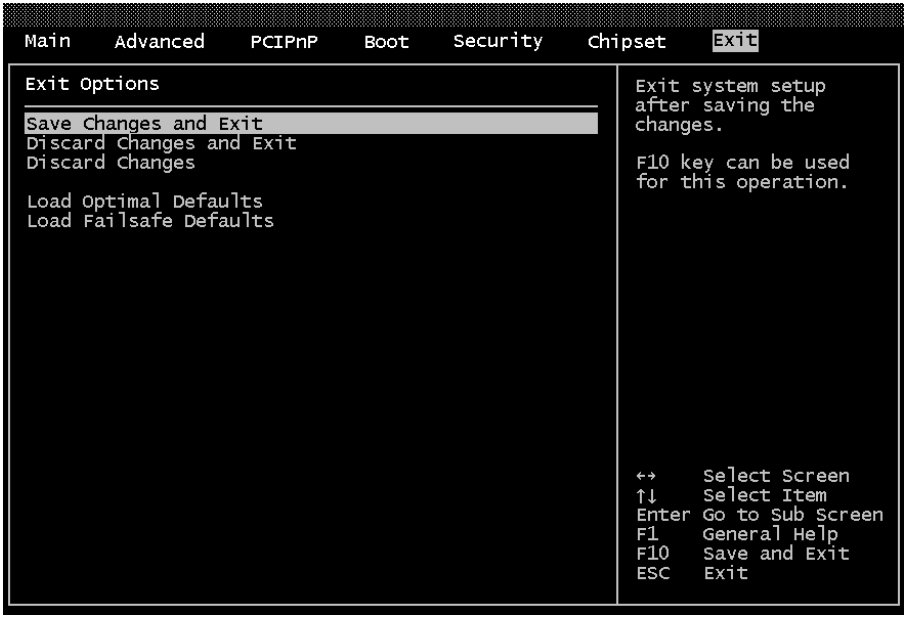


- **ISA Configuration**



This allows you to set the ISA bus frequency and to select the clock value of I/O and Memory.

3.7. Exit Setup

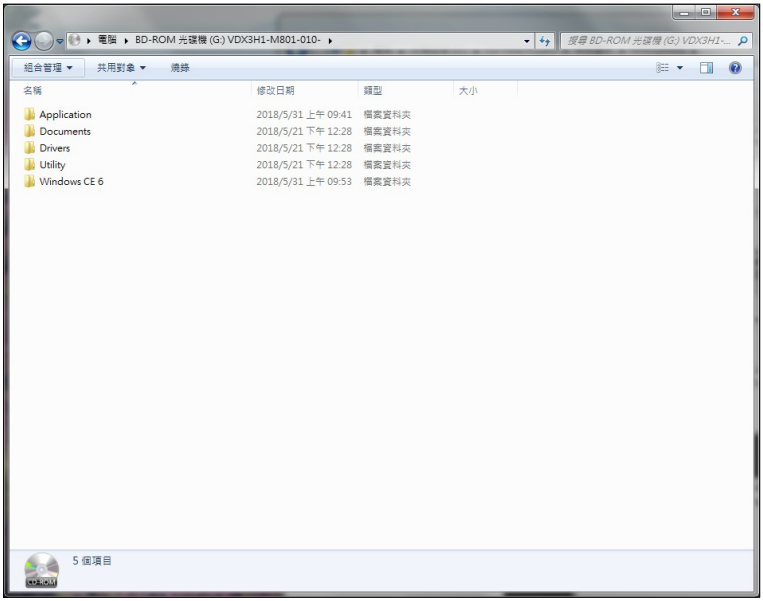


- **Save Changes and Exit**
  Exit system setup after saving the changes. F10 key can be used for this operation.
- **Discard Changes and Exit**
  Exit system setup without saving any changes. ESC key can be used for this operation.
- **Discard Changes**
  Discard changes done so far to any of the setup questions. F7 key can be used for this operation.
- **Load Optimal Defaults**
  Load Optimal Default values for all the setup questions. F9 key can be used for this operation.
- **Load Failsafe Defaults**
  Load Failsafe Default values for all the setup questions. F8 key can be used for this operation.

4. Utility Installation

To test the utility, put the Driver CD into your CD-ROM drive.

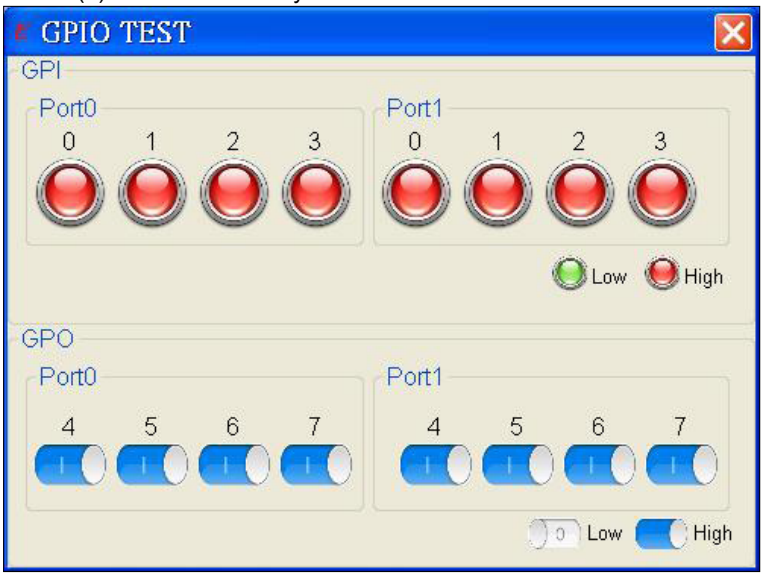
Step 1: Enter the "**Utility**" folder. Run the excution file.



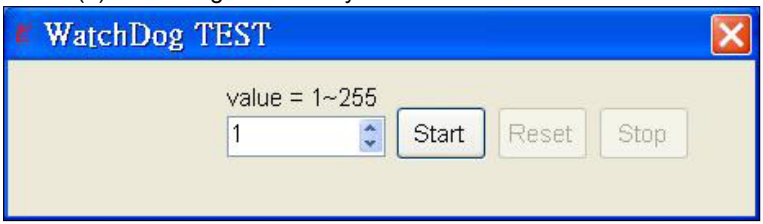
Step 2: The "**Test Utility**" screen appears.

Click Test Item:

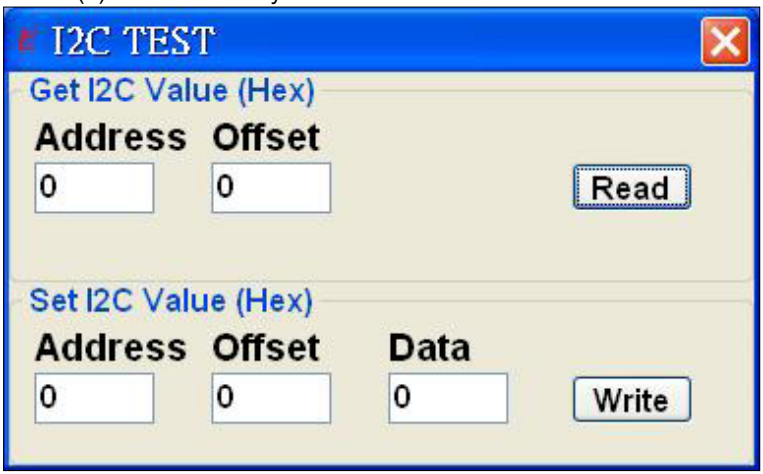
Select (1) GPIO TEST Utility:



Select (2) WatchDog TEST Utility:



Select (3) I2C TEST Utility:



5. Software Installation and Programming Guide

5.1. Introduction

5.1.1. Environment

This test utility develop based on Windows CE 6.0, Windows XP (32bit), and Windows 7 (32bit).

5.1.2. GPIO and Watchdog

This model provides both GPIO interface and Watchdog timer. Users can use the GPIO and Watchdog APIs to configure and to access the GPIO interface and the Watchdog timer. he GPIO has 16 input or output pins. The Watchdog timer can be set to 1~511 seconds. Setting the timer to zero disables the timer. The remaining seconds of the timer to reboot can be read from the timer.

5.2. API List and Descriptions

5.2.1. General

Syntax:	**lib_init(void)**
Description:	library initialization, using this library must call this function first. Note: The initialization may have to wait for 1 minute due to scan pic port.
Parameters:	None
Return Value:	0: Successful, -1: Fail.

Syntax:	**lib_close(void)**
Description:	library close, when not using this library must call this function.
Parameters:	None
Return Value:	0: Successful, -1: Fail.

5.2.2. GPIO

The GPIO port 0 and 1 are always free for use normally.

GPIO direction and data registers:

	Port 0	Port 1	Description
Data Register	78H	79H	
Direction Register	98H	99H	0: GPIO pin is input mode 1: GPIO pin is output mode

If send value 0FH to port 98H, it means that GPIO port0 [7-4] are input mode and port[3-0] are output mode.

If send value 00H to port 98H, it means that GPIO port0 [7-0] are input mode.

If send value FFH to port 98H, it means that GPIO port0 [7-0] are output mode.

If send value 03H to port 98H, it means that GPIO port0 [7-2] are input mode and port[1-0] are output mode.

Syntax:	**byte readPort (byte nPort)**
Description:	Get the status of GPIO data register
Parameters:	nPort: Direction register value
Return Value:	0x00~0xFF (output mode: bit = 0 is Low, bit = 1 is High)

Syntax:	**void writePort(byte nPort, byte dbValue)**
Description:	Set the status of GPIO data register
Parameters:	nPort: Direction register value dbValue: Data register value
Return Value:	None

5.2.3. Watchdog

Syntax:	void wdt_start(int nTime, byte nEvent)
Description:	This function sets the watchdog timer register to the value 'val' and starts to count down. The value could be 1 ~ 511. The unit is second.
Parameters:	nTime: The range is 1~511. nEvent: IRQ3 = 0x10 IRQ4 = 0x20 IRQ5 = 0x30 IRQ6 = 0x40 IRQ7 = 0x50 IRQ9 = 0x60 IRQ10 = 0x70 IRQ11 = 0x80 IRQ12 = 0x90 IRQ14 = 0xA0 IRQ15 = 0xB0 NMI = 0xC0 SYS_RESET = 0xD0
Return Value:	None

Syntax:	void wdt_reset()
Description:	This function reset trigger timer.
Parameters:	None
Return Value:	None

Syntax:	void wdt_disable()
Description:	This function stop trigger timer.
Parameters:	None
Return Value:	None

5.2.4. I2C

Syntax:	int i2c_read_byte(byte device_address, byte index, byte *data)
Description:	This function get the i2c index data. The data value save to pointer data.
Parameters:	None
Return Value:	If this function works successfully, the function returns 0, any other value stands for error.

Syntax:	int i2c_write_byte(byte device_address, byte index, byte data)
Description:	This function write the i2c index data.
Parameters:	None
Return Value:	If this function works successfully, the function returns 0, any other value stands for error.

6. FAQ

Q 1. Where can I find the serial number of this product?

- The serial number (S/N) is a label printed with alpha-numeric character. You can find the S/N label on the bottom of this product or on its packing box.

Q 2. Why the storage device connected from IDE1 and SATA1 connector cannot run WinCE6.0 ?

- Both the default settings of **IDE1** and **SATA1** connectors are set to **IDE** mode, does not support WinCE6.0
- To support WinCE6.0 for **IDE1** and **SATA1** connectors, you have to run the **AHCI.bat** file to update its firmware and set it to **AHCI** mode.
- You can find the **AHCI.bat** file in the folder **DOS Utility** of the Driver CD.
- NOTE: The AHCI mode is not supported by Windows XP. You can run the **IDE.bat** file to recover its firmware to IDE mode.
- Make sure to configure the BIOS settings as:
  IDE → Legacy mode
  Legacy USB Support → Disable

Q 3. What to do when the Windows screen size is larger than your monitor dimensions?

- Move your mouse pointer to the lower right corner of the screen toolbar where you can find a VGA Utility icon. Make a right click on the VGA Utility icon. Its setting menu pops up. Cancel the **EDID Mode Expand** function, the Windows screen will fit your monitor screen size.

Technical Support Form

We deeply appreciate your purchase of Acrosser products. Please find the "**tech_form.doc**" file in our utility CD. If you have any questions or problems about Acrosser products, please fill in the following information. We will answer your questions in the shortest time possible.

Describe Your Info and Acrosser System Info

- Your Company Name: _____
- Your Contact Info: _____ Phone Number: _____
- Your E-Mail Address: _____
- Your Company Address: _____

  _____
- Acrosser Model Name: _____
- Acrosser Serial Number: _____

Describe System Configuration

- CPU Type: _____
- Memory Size: _____
- Storage Device (e.g. HDD, CF, or SSD): _____
- Additional Peripherals (e.g. Graphic Card): _____
- Operating System & Version (e.g. Windows 7 Embedded): _____
- Special API or Driver: _____

  (If yes, please provide it for debug.)
- Running Applications: _____
- Others: _____

Describe Your Problems or Questions:

Send the above information to one of the following Acrosser contacts:

- Acrosser Local Sales Representative
- Acrosser Authorized Sales Channels
- Acrosser Inquiry --- http://www.acrosser.com/inquiry.html
- Acrosser FAX Number --- 886-2-29992887

To Make Your
Embedded
Idea a Reality

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