

PICO-CV01

Intel® Atom™N2600 Processor
Gigabit Ethernet
5 USB 2.0, 2 COM
4-bit Digital I/O
mSATA/Mini Card (Half-size) x 1
1 SATA 3.0Gb/s

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Packing List

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

- 1 Heatsink
- 1 SATA Power Cable
- 1 Power Cable
- 1 SATA Cable
- 1 CD-ROM for Manual (in PDF Format) and Drivers
- 1 PICO-CV01

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

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Chapter

1

**General
Information**

1.1 Introduction

The PICO-CV01 is the first embedded board with PICO-ITX form factor AAeon developed. It supports Intel® Atom™ N2600 processor up to 1.6 GHz. Moreover, it equips Intel® NM10 chipset offers a high performance computing platform with low power consumption. This new product supports DDR3 SODIMM at speeds of 800 MHz, up to 2 GB.

One SATA 3.0Gb/s and one mSATA interfaces provide ample storages. With one Gigabit Ethernet, two COM ports, and five USB2.0, the PICO-CV01 meets the requirements of today's demanding applications.

Display requirements are met with an abundance of interfaces such as VGA, HDMI, and LVDS. In addition, the PICO-CV01 supports 18-bit Single Channel LVDS with PWM function.

With all of its integrated features, the PICO-CV01 strikes a balance of performance and price. This versatile product targets Industrial Automation, Entertainment, Networking, KIOSK/POS, Transportation, Banking, Healthcare and Digital Signage applications that require high performance and high reliability.

1.2 Features

- Intel® Atom™ N2600 Processor Up to 1.6 GHz
- Intel® NM10
- SODIMM DDR3 800 MHz Memory Up to 2 GB
- Gigabit Ethernet x 1
- HDMI Support
- 18-bit Single Channel LVDS LCD
- HD Audio for Line-in/out & MIC
- mSATA/ Mini Card (Half-size) x 1, SATA 3.0Gb/s x 1
- USB2.0 x 5, COM x 2, 4-bit Digital I/O
- DC 12V Power Input

1.3 Specifications

System

- **From Factor** PICO-ITX
- **Processor** Intel® Atom™ N2600 processor up to 1.6 GHz
- **System Memory** SODIMM DDR3 800 MHz, up to 2 GB
- **Chipset** Intel® Atom™ N2600 + NM10
- **Ethernet** Realtek RTL-8111E, 10/100/1000Base-TX, RJ-45 x 1
- **BIOS** AMI BIOS-32 Mb ROM
- **Wake On LAN** Yes
- **Watchdog Timer** 255 levels
- **H/W Status Monitoring** Vcore, +1.5V_DDR
- **Expansion Interface** mSATA/ Mini Card (Half-size) x 1
- **Battery** Lithium Battery
- **Power Requirement** DC 12V, AT/ATX (Default)
- **Board Size** 3.94" x 2.756" (100mm x 72mm)
- **Gross Weight** 1.7 lb (0.77 Kg)
- **Operating Temperature** 32°F~140°F (0°C~60°C)
- **Storage Temperature** -40°F~176°F (-40°C~80°C)
- **Operating Humidity** 0% ~ 90% relative humidity, non-condensing

Display: Supports CRT/LCD, HDMI/DVI/LCD simultaneous / dual view displays

- **Chipset** Intel® Atom™ N2600 Processor
- **Memory** Shared system memory up to 256MB
- **Resolution** Up to 1366 x 768 (18-bit) @ 60 Hz for LVDS;
Up to 1920 x 1200 @ 60 Hz for CRT and HDMI
- **LCD Interface** 18-bit single channel LVDS with PWM function

I/O: Fintek F81801U-I

- **Storage** SATA 3.0Gb/s x 1 , mSATA x 1
- **Serial Port** RS-232 x 1
RS-232/422/485 x 1
- **USB** USB2.0 x 5
- **Digital I/O** 4-bit Programmable (2-in/ 2-out)
- **Audio** Buzzer x 1, HD Audio Codec (Realtek ALC662) for Line-in/out & MIC x 1

Chapter

2

**Quick
Installation
Guide**

2.1 Safety Precautions

Warning!



Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

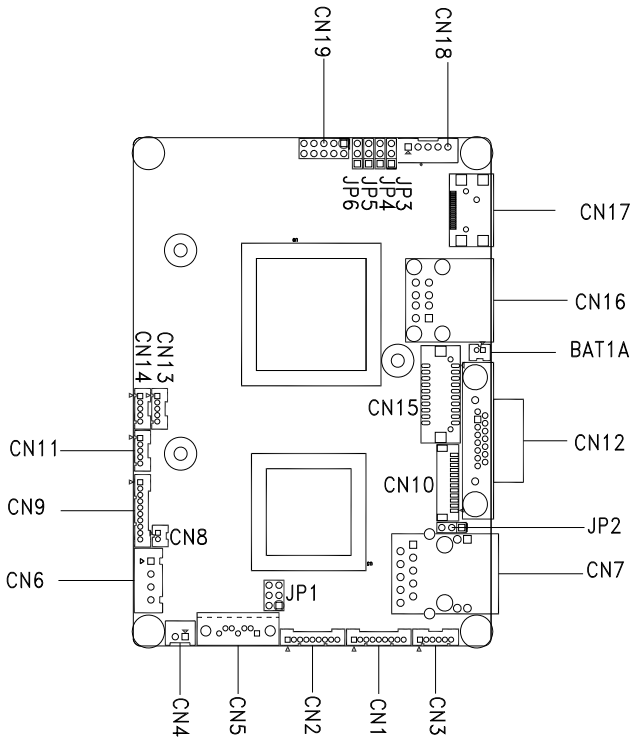
Caution!



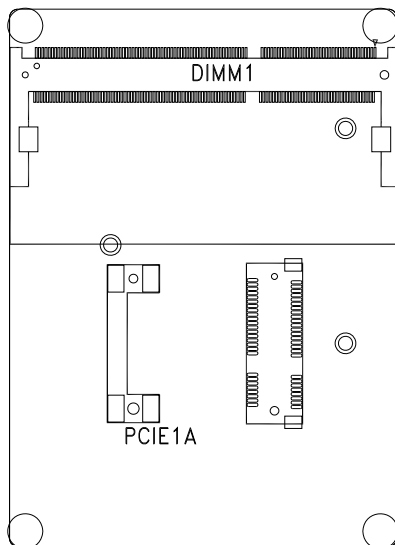
Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis

2.2 Location of Connectors and Jumpers

Component Side

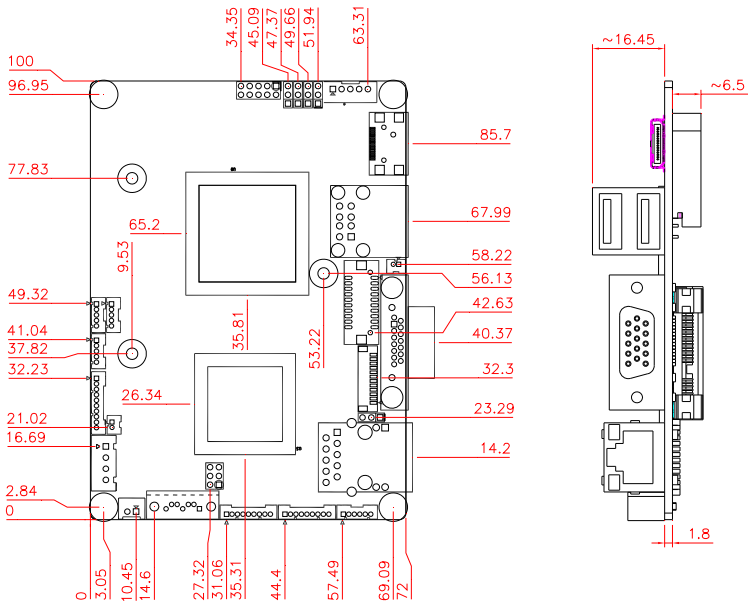


Solder Side

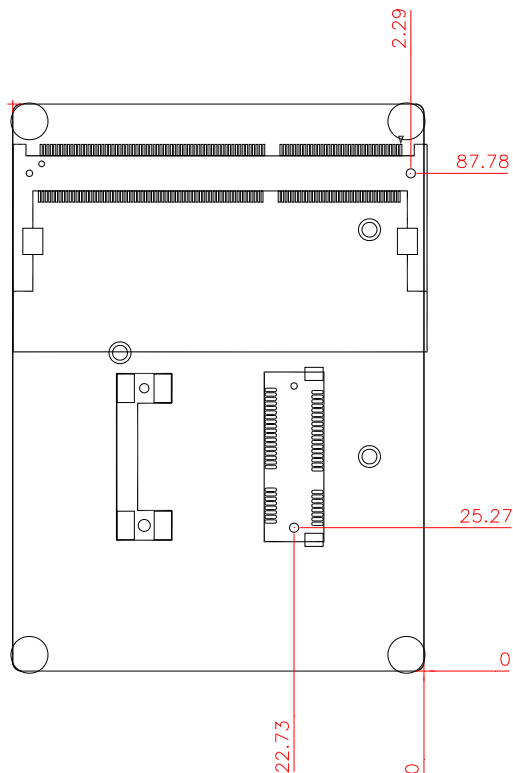


2.3 Mechanical Drawing

Component Side



Solder Side



2.4 List of Jumpers

The board has a number of jumpers that allow you to configure your system to suit your application.

The table below shows the function of each of the board's jumpers:

Label	Function
JP1	COM2 RI/+5/+12V Selection
JP2	Clear CMOS
JP3	LVDS Inverter/ Backlight Voltage Selection
JP4	LVDS Inverter/ Backlight Bias/PWM Mode Selection
JP5	LVDS Operating Voltage Selection
JP6	AT/ATX Power Mode Selection

2.5 List of Connectors

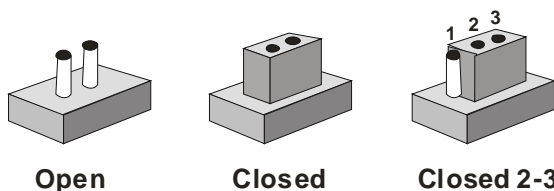
The board has a number of connectors that allow you to configure your system to suit your application. The table below shows the function of each board's connectors:

Label	Function
CN1	COM Port 1
CN2	COM Port 2
CN3	Digital I/O
CN4	+5V Output for SATA HDD
CN5	SATA Port
CN6	External 12V Input (12V Only)
CN7	RJ-45 Ethernet
CN8	Buzzer
CN9	Audio Line In/Out and MIC Connector
CN10	LPC Expansion I/F
CN11	USB Port 5
CN12	Analog CRT Display
CN13	USB Port 3
CN14	USB Port 4
CN15	18-bit LVDS Output
CN16	USB Port 1 and 2
CN17	HDMI Type C
CN18	LVDS Inverter/ Backlight Connector
CN19	Front Panel

2.6 Setting Jumpers

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip.

To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2 or 2 and 3.

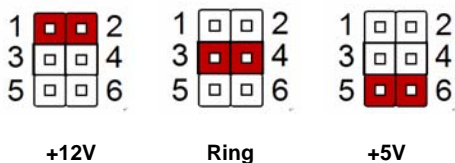


A pair of needle-nose pliers may be helpful when working with jumpers.

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

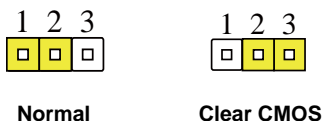
Generally, you simply need a standard cable to make most connections.

2.7 COM2 Pin8 Function Selection (JP1)



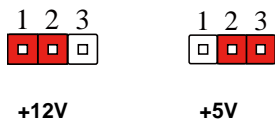
JP1	Function
1-2	+12V
3-4	Ring
5-6	+5V

2.8 Clear CMOS Selection (JP2)



JP2	Function
1-2	Normal (Default)
2-3	Clear CMOS

2.9 LVDS Port 1 Backlight Inverter VCC Selection (JP3)



JP3	Function
1-2	+12V

2-3 +5V (Default)

2.10 LVDS Port 1 Backlight Lightness Control Mode Selection (JP4)



VR Mode



PWM Mode

JP4	Function
1-2	VR Mode
2-3	PWM Mode (Default)

2.11 LVDS Port 1 Operating VDD Selection (JP5)



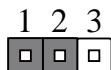
+5V



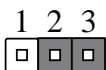
+3.3V

JP5	Function
1-2	+5V
2-3	+3.3V (Default)

2.12 AT/ATX Power Supply Mode Selection (JP6)



AT Mode

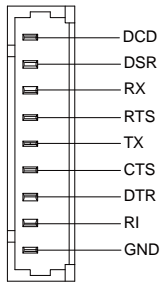


ATX Mode

JP6	Function
1-2	AT Mode

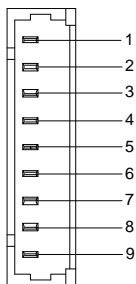
 2-3 ATX Mod (Default)

2.13 COM Port 1 Connector (CN1)



Pin	Pin Name	Signal Type	Signal Level
1	DCD1	IN	
2	DSR1	IN	
3	RX1	IN	
4	RTS1	OUT	±9V
5	TX1	OUT	±9V
6	CTS1	IN	
7	DTR1	OUT	±9V
8	RI1	IN	
9	GND	GND	

2.14 COM Port 2 Connector (CN2)



RS-232

Pin	Pin Name	Signal Type	Signal Level
1	DCD2	IN	
2	DSR2	IN	
3	RX2	IN	
4	RTS2	OUT	±9V
5	TX2	OUT	±9V
6	CTS2	IN	
7	DTR2	OUT	±9V
8	RI/+5V/+12V	IN/ PWR	+5V/+12V
9	GND	GND	

RS-422

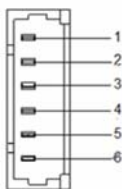
Pin	Pin Name	Signal Type	Signal Level
1	RS422_TX-	OUT	±5V
2	NC		

PICO-ITX Board**PICO-CV01**

3	RS422_TX+	OUT	
4	NC		
5	RS422_RX+	IN	±5V
6	NC		
7	RS422_RX-	IN	
8	NC/+5V/+12V	PWR	+5V/+12V
9	GND	GND	

RS-485

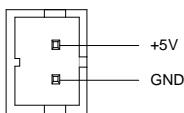
Pin	Pin Name	Signal Type	Signal Level
1	RS485_D-	I/O	±5V
2	NC		
3	RS485_D+	I/O	±5V
4	NC		
5	NC		
6	NC		
7	NC		
8	NC/+5V/+12V	PWR	+5V/+12V
9	GND	GND	

2.15 DIO Connector (CN2)

Pin	Pin Name	Signal Type	Signal Level
1	DIO_PWR	PWR	+3.3V
2	DIO0	I/O	+3.3V
3	DIO1	I/O	+3.3V
4	DIO2	I/O	+3.3V
5	DIO3	I/O	+3.3V
6	GND	GND	

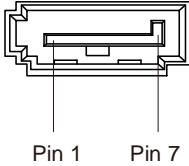
GPIO Port	Location (Pin #)	Access Address based on SIO LDN6	
		Input	Output
		GPIO1	2
GPIO2	3	Reg 0xD2, bit 1	Reg 0xD1, bit 1
GPIO3	4	Reg 0xD2, bit 2	Reg 0xD1, bit 2
GPIO4	5	Reg 0xD2, bit 3	Reg 0xD1, bit 3

2.16 +5V Output for SATA HDD Connector (CN4)



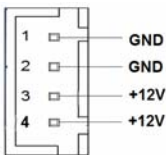
Pin	Pin Name	Signal Type	Signal Level
1	+5V	PWR	+5V
2	GND	GND	

2.17 SATA Port Connector (CN5)



Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	SATA_TX+	DIFF	
3	SATA_TX-	DIFF	
4	GND	GND	
5	SATA_RX-	DIFF	
6	SATA_RX+	DIFF	
7	GND	GND	

2.18 External 12V Input Only Connector (CN6)



Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	GND	GND	
3	+12V	PWR	+12V

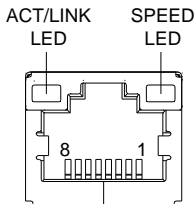
4

+12V

PWR

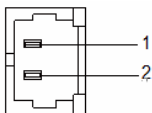
+12V

2.19 Realtek LAN Port RJ-45 Connector (CN7)



Pin	Pin Name	Signal Type	Signal Level
1	MDIO+	DIFF	
2	MDIO-	DIFF	
3	MDI1+	DIFF	
4	MDI2+	DIFF	
5	MDI2-	DIFF	
6	MDI1-	DIFF	
7	MDI3+	DIFF	
8	MDI3-	DIFF	

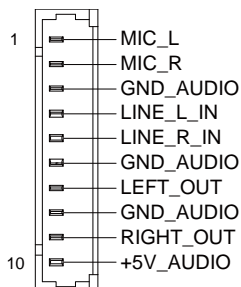
2.20 Buzzer Connector (CN8)



Pin	Pin Name	Signal Type	Signal Level
1	+3.3V	PWR	+3.3V

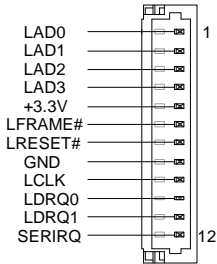
2	SPK	OUT
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2.21 Audio I/O Port Connector (CN9)



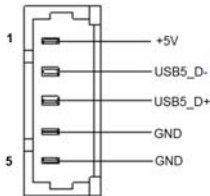
Pin	Pin Name	Signal Type	Signal Level
1	MIC_L	IN	
2	MIC_R	IN	
3	GND_AUDIO	GND	
4	LINE_L_IN	IN	
5	LINE_R_IN	IN	
6	GND_AUDIO	GND	
7	LEFT_OUT	OUT	
8	GND_AUDIO	GND	
9	RIGHT_OUT	OUT	
10	+5V_AUDIO	PWR	+5V

2.22 LPC Port Connector (CN10)



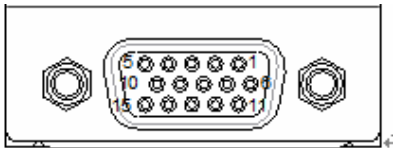
Pin	Pin Name	Signal Type	Signal Level
1	LAD0	I/O	+3.3V
2	LAD1	I/O	+3.3V
3	LAD2	I/O	+3.3V
4	LAD3	I/O	+3.3V
5	+3.3V	PWR	+3.3V
6	LFRAME#	IN	
7	LRESET#	OUT	+3.3V
8	GND	GND	
9	LCLK	OUT	
10	LDRQ0	IN	
11	LDRQ1	IN	
12	SERIRQ	I/O	+3.3V

2.23 USB2.0 Port 5 Connector (CN11)



Pin	Pin Name	Signal Type	Signal Level
1	+5V	PWR	+5V
2	USB5_D-	DIFF	
3	USB5_D+	DIFF	
4	GND	GND	
5	GND	GND	

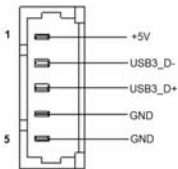
2.24 VGA Port Connector (CN12)



Pin	Pin Name	Signal Type	Signal Level
1	RED	OUT	
2	GREEN	OUT	
3	BLUE	OUT	
4	NC		

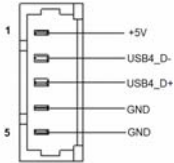
PICO-ITX Board**PICO-CV01**

5	GND	GND	
6	RED_GND_RTN	GND	
7	GREEN_GND_RTN	GND	
8	BLUE_GND_RTN	GND	
9	+5V	PWR	+5V
10	GND	GND	
11	NC		
12	DDC_DATA	I/O	+5V
13	HSYNC	OUT	
14	VSYNC	OUT	
15	DDC_CLK	I/O	+5V

2.25 USB2.0 Port 3 Connector (CN13)

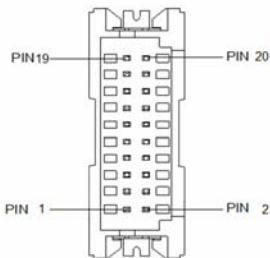
Pin	Pin Name	Signal Type	Signal Level
1	+5V	PWR	+5V
2	USB3_D-	DIFF	
3	USB3_D+	DIFF	
4	GND	GND	
5	GND	GND	

2.26 USB2.0 Port 4 Connector (CN14)



Pin	Pin Name	Signal Type	Signal Level
1	+5V	PWR	+5V
2	USB4_D-	DIFF	
3	USB4_D+	DIFF	
4	GND	GND	
5	GND	GND	

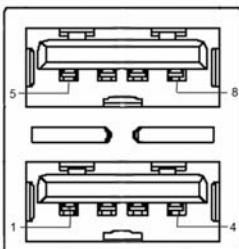
2.27 18-bit LVDS Output Connector (CN15)



Pin	Pin Name	Signal Type	Signal Level
1	BKL_ENABLE	OUT	
2	BKL_CONTROL	OUT	
3	LCD_PWR		+3.3V/+5V
4	LCD_PWR	PWR	+3.3V/+5V

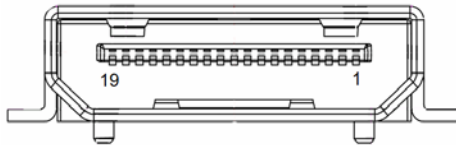
5	LVDS_A_CLK-	DIFF	
6	LVDS_DA2+	DIFF	
7	LVDS_A_CLK+	DIFF	
8	LVDS_DA2-	DIFF	
9	LCD_PWR	DIFF	+3.3V/+5V
10	GND	GND	
11	LVDS_DA0+	DIFF	
12	LVDS_DA3+	DIFF	
13	LVDS_DA0-	DIFF	
14	LVDS_DA3-	DIFF	
15	GND	GND	
16	GND	GND	
17	LVDS_DA1+	DIFF	
18	DDC_DATA	I/O	+3.3V
19	LVDS_DA1-	DIFF	
20	DDC_CLK	I/O	+3.3V

2.28 USB Port 1 and Port 2 Connector (CN16)



Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V
2	USB1_D-	DIFF	
3	USB1_D+	DIFF	
4	GND	GND	
5	+5VSB	PWR	+5V
6	USB2_D-	DIFF	
7	USB2_D+	DIFF	
8	GND	GND	

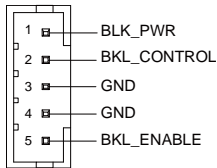
2.29 HDMI Type C Connector (CN17)



Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	HDMI_TX2+	DIFF	
3	HDMI_TX2-	DIFF	
4	GND	GND	
5	HDMI_TX1+	DIFF	
6	HDMI_TX1-	DIFF	
7	GND	GND	
8	HDMI_TX0+	DIFF	

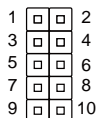
PICO-ITX Board**PICO-CV01**

9	HDMI_TX0-	DIFF	
10	GND	GND	
11	HDMI_CLK+	DIFF	
12	HDMI_CLK-	DIFF	
13	GND	GND	
14	NC	NC	
15	HDMI_DDC_CLK	I/O	+5V
16	HDMI_DDC_DATA	I/O	+5V
17	NC	NC	
18	DPD_PWR	RWR	+5V
19	DPD_HPD	IN	

2.30 LVDS Port Inverter/ Backlight Connector (CN18)

Pin	Pin Name	Signal Type	Signal Level
1	BKL_PWR	PWR	+5V / +12V
2	BKL_CONTROL	OUT	
3	GND	GND	
4	GND	GND	
5	BKL_ENABLE	OUT	+3.3V

2.31 Front Panel Connector (CN19)



Pin	Pin Name	Signal Type	Signal Level
1	PWR_BTN-		
2	PWR_BTN+		
3	HDD_LED-		
4	HDD_LED+		
5	SPEAKER-		
6	SPEAKER+		
7	PWR_LED-		
8	PWR_LED+		
9	H/W RESET-		
10	H/W RESET+		

2.32 DDR3 SODIMM Slot (DIMM1)

Standard specification

2.33 Mini Card Slot (PCIE1)

Pin	Pin Name	Signal Type	Signal Level
1	PCIE_WAKE#	IN	
2	+3.3VSB/+3.3V	PWR	+3.3V
3	NC		
4	GND	GND	

PICO-ITX Board**PICO-CV01**

5	NC		
6	+1.5V	PWR	+1.5V
7	PCIE_CLK_REQ#	IN	
8	NC		
9	GND	GND	
10	NC		
11	PCIE_REF_CLK-	DIFF	
12	NC		
13	PCIE_REF_CLK+	DIFF	
14	NC		
15	GND	GND	
16	NC		
17	NC		
18	GND	GND	
19	NC		
20	W_DISABLE#	OUT	+3.3V
21	GND	GND	
22	PCIE_RST#	OUT	+3.3V
23	PCIE_RX-/mSATA_RX+	DIFF	
24	+3.3VSB/+3.3V	PWR	+3.3V
25	PCIE_RX+/mSATA_RX-	DIFF	
26	GND	GND	
27	GND	GND	
28	+1.5V	PWR	+1.5V

PICO-ITX Board**PICO-CV01**

29	GND	GND	
30	SMB_CLK	I/O	+3.3V
31	PCIE_TX-/mSATA_TX-	DIFF	
32	SMB_DATA	I/O	+3.3V
33	PCIE_TX+/mSATA_TX+	DIFF	
34	GND	GND	
35	GND	GND	
36	USB8_D-	DIFF	
37	GND	GND	
38	USB8_D+	DIFF	
39	+3.3VSB/+3.3V	PWR	+3.3V
40	GND	GND	
41	+3.3VSB/+3.3V	PWR	+3.3V
42	NC		
43	GND/NC	GND	
44	NC		
45	NC		
46	NC		
47	NC		
48	+1.5V	PWR	+1.5V
49	NC		
50	GND	GND	
51	NC		
52	+3.3VSB/+3.3V	PWR	+3.3V

Below Table for China RoHS Requirements

产品中有毒有害物质或元素名称及含量

AAEON Main Board/ Daughter Board/ Backplane

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板 及其电子组件	×	○	○	○	○	○
外部信号 连接器及线材	×	○	○	○	○	○
<p>O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下。</p> <p>X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。</p> <p>备注：此产品所标示之环保使用期限，系指在一般正常使用状况下。</p>						

Chapter

3

**AMI
BIOS Setup**

3.1 System Test and Initialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors.

System configuration verification

These routines check the current system configuration against the values stored in the CMOS memory. If they do not match, the program outputs an error message. You will then need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

1. You are starting your system for the first time
2. You have changed the hardware attached to your system
3. The CMOS memory has lost power and the configuration information has been erased.

The PICO-CV01 CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs down.

3.2 AMI BIOS Setup

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

Entering Setup

Power on the computer and press or <F2> immediately. This will allow you to enter Setup.

Main

Set the date, use tab to switch between date elements.

Advanced

Advanced BIOS Features Setup including TPM, ACPI, etc.

Chipset

Host bridge parameters.

Boot

Enables/disable quiet boot option.

Security

Set setup administrator password.

Save&Exit

Exit system setup after saving the changes.

Setup Menu

Setup submenu: Main

```

Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.
Main  Advanced  Chipset  Boot  Security  Save & Exit

BIOS Information
  PICO-CV01 R1.0(PICVAM10) (06/05/2012)

BIOS Vendor      American Megatrends
Core Version     4.6.5.3
Compliance      UEFI 2.3; PI 1.2

System Date      [Mon 06/11/2012]
System Time      [15:06:34]

Access Level     Administrator

Set the Date. Use Tab to
switch between Date elements.

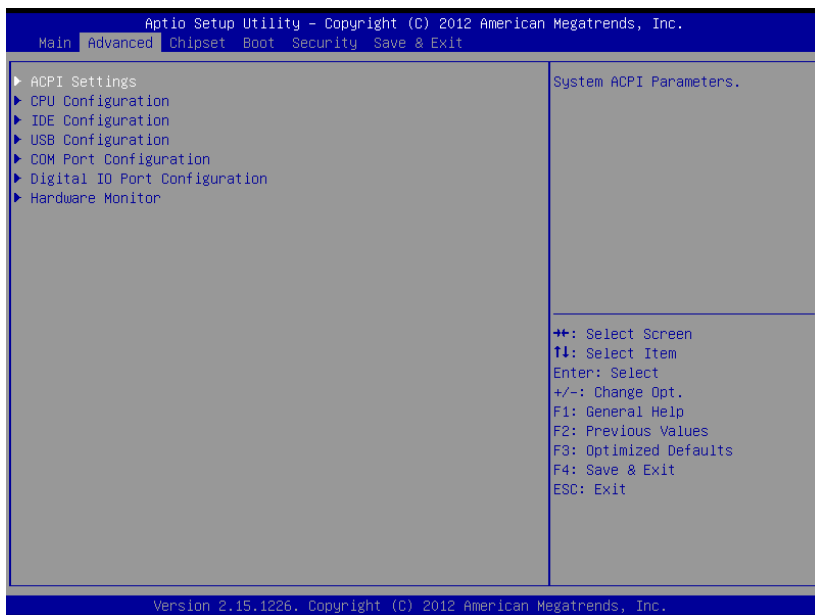
+/: Select Screen
Tl: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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```

Options summary: (**default setting**)

System Date	Day MM:DD:YYYY	
Change the month, year and century. The 'Day' is changed automatically.		
System Time	HH : MM : SS	
Change the clock of the system.		

Setup submenu: Advanced

Options summary: (**default setting**)

ACPI Settings		
System ACPI Parameters		
CPU Configuration		
CPU Configuration Parameters		
IDE Configuration		
IDE Device Options Settings		
USB Configuration		
USB Configuration Parameters		
COM Port Configuration		

COM Port Configuration Parameters		
Digital IO Port Configuration		
DIO configuration		
H/W Monitor		
Monitor hardware status		

ACPI Settings

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Advanced

<p>ACPI Settings</p> <p>Enable Hibernation [Enabled]</p> <p>ACPI Sleep State [AUTO]</p> <p>Wake on Ring [Enabled]</p> <p>▶ RTC Wake Settings</p>	<p>Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.</p>
<p>←+: Select Screen</p> <p>↑↓: Select Item</p> <p>Enter: Select</p> <p>+/-: Change Opt.</p> <p>F1: General Help</p> <p>F2: Previous Values</p> <p>F3: Optimized Defaults</p> <p>F4: Save & Exit</p> <p>ESC: Exit</p>	

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Options summary: **(default setting)**

Enable Hibernation	Enabled	
	Disabled	
Enabled or disabled hibernate (OS/S4 Sleep State).		
ACPI Sleep State	Suspend Disabled	

	S1 only(CPU Stop Clock)	
	S3 only(Suspend to RAM)	
	AUTO	
Select the ACPI state used for System Suspend		
Wake on Ring	Enabled	
	Disabled	
Enabled or disabled wake on ring function.		
RTC Wake Settings		
Enable system to wake from S5 using RTC alarm.		

RTC Wake Settings

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Advanced

Wake system with Fixed Time	[Enabled]	Enable or disable System wake on alarm event. When enabled, System will wake on the hr:min::sec specified
Wake up day	0	
Wake up hour	0	
Wake up minute	0	
Wake up second	0	
Wake system with Dynamic Time	[Disabled]	
Wake up minute increase	1	

++: Select Screen
T1: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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Options summary: *(default setting)*

Wake system with Fixed Time	Disabled	
	Enabled	
Enable or disable System wake on alarm event. Wake up time is setting by following settings.		
Wake up day	0-31	
Select 0 for daily system wake up 1-31 for which day of the month that you would like the system to wake up		
Wake up hour	0-23	
Wake up minute	0-59	
Wake up second	0-59	
Wake system with Dynamic Time	Disabled	
	Enabled	
Enable or disable System wake on alarm event. Wake up time is current time + Increase minutes.		
Wake up minute increase	1-5	

CPU Configuration

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Advanced

CPU Configuration		Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology).
Processor Type	Intel(R) Atom(TM) CPU N2 EMT64	
Processor Speed	1600 MHz	
System Bus Speed	400 MHz	
Ratio Status	16	
Actual Ratio	16	
System Bus Speed	400 MHz	
Processor Stepping	30661	
Microcode Revision	269	
L1 Cache RAM	2x56 k	
L2 Cache RAM	2x512 k	
Processor Core	Dual	
Hyper-Threading	Supported	
Hyper-Threading	[Enabled]	++: Select Screen
Execute Disable Bit	[Enabled]	T1: Select Item
Limit CPUID Maximum	[Disabled]	Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit

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Options summary: (default setting)

Hyper-Threading	Disabled	
	Enabled	
En/Disable CPU Hyper-Threading function		
Execute Disable Bit	Disabled	
	Enabled	
En/Disable XD bit for supporting OS		
Limit CPUID Maximum	Disabled	
	Enabled	
Disabled for Windows XP		

IDE Configuration

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Advanced

SATA Port	Drive Modelname	Select a configuration for SATA Controller.
mSATA Port	Drive Modelname	
SATA Controller(s)	[Enabled]	
Configure SATA as	[IDE]	

++: Select Screen
 ↑↓: Select Item
 Enter: Select
 +/-: Change Opt.
 F1: General Help
 F2: Previous Values
 F3: Optimized Defaults
 F4: Save & Exit
 ESC: Exit

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Options summary: (**default setting**)

SATA Controller(s)	Disabled	
	Enabled	
En/Disable SATA controller		
Configure SATA as	IDE	
	AHCI	
Configure SATA controller operating as IDE/AHCI mode.		

USB Configuration

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Advanced

<p>USB Configuration</p> <p>USB Devices: 1 Drive, 1 Keyboard, 1 Mouse</p> <p>Legacy USB Support [Enabled]</p> <p>Mass Storage Devices: USB Device ModeName [Auto]</p>	<p>Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.</p> <hr/> <p> ++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit </p>
---	---

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Options summary: (**default setting**)

Legacy USB Support	Enabled	
	Disabled	
	Auto	
<p>Enables BIOS Support for Legacy USB Support. When enabled, USB can be functional in legacy environment like DOS. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI application</p>		
Device Name	Auto	
(Emulation Type)	Floppy	

	Forced FDD	
	Hard Disk	
	CD-ROM	
<p>If Auto. USB devices less than 530MB will be emulated as Floppy and remaining as Floppy and remaining as hard drive. Forced FDD option can be used to force a HDD formatted drive to boot as FDD(Ex. ZIP drive)</p>		

COM Port Configuration

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Advanced

<p>COM Port Configuration</p> <p>F81801 Super IO Chip F81801</p> <ul style="list-style-type: none"> ▶ Serial Port 1 Configuration ▶ Serial Port 2 Configuration 	<p>Set Parameters of Serial Port 1 (COMA)</p> <hr/> <p> ++: Select Screen T1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit </p>
--	---

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Options summary: **(default setting)**

Serial Port 1/2 Configuration		
Set Parameters of Serial Port 1/2		

Select a resource setting for Super IO device.

Serial Port 2 Configuration

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Advanced

<p>Serial Port 2 Configuration</p> <p>Serial Port [Enabled] Device Settings IO=2F8h; IRQ=3;</p> <p>Change Settings [Auto] Device Type [RS232]</p>	<p>Enable or Disable Serial Port (COM)</p> <p> ++: Select Screen ↑: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit </p>
---	--

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Options summary: **(default setting)**

Serial Port	Disabled	
	Enabled	
En/Disable specified serial port.		
Change Settings	Auto	
	IO=2F8h; IRQ=3;	
	IO=3F8h; IRQ=3,4,5,7,10,11,12;	
	IO=2F8h; IRQ=3,4,5,7,10,11,12;	
	IO=3E8h; IRQ=3,4,5,7,10,11,12;	

	IO=2E8h; IRQ=3,4,5,7,10,11,12;	
Select a resource setting for Super IO device.		
Device Type	RS232	
	RS422	
	RS485	
Configure COM2 operated as RS232, RS422 or RS485.		

Digital IO Port Configuration

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Advanced

<pre> Digital IO Port Configuration GPIO1-4: 0xD1h[0-3]@SIO LDN6 GPIO1 Direction [Input] GPIO2 Direction [Input] GPIO3 Direction [Output] Output Level [Low] GPIO4 Direction [Output] Output Level [Low] </pre>	<p>Set GPIO as Input or Output</p> <hr/> <p> ++: Select Screen F1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit </p>
--	--

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Options summary: (**default setting**)

GPIO1/GPIO2	Input	
	Direction	Output
Set GPIO1/GPIO2 as Input or Output		

GPIO3/GPIO4	Input	
Direction	Output	
Set GPIO3/GPIO4 as Input or Output		
Output Level	Hi	
	Low	
Set GPIO Level when used as Output		

H/W Monitor

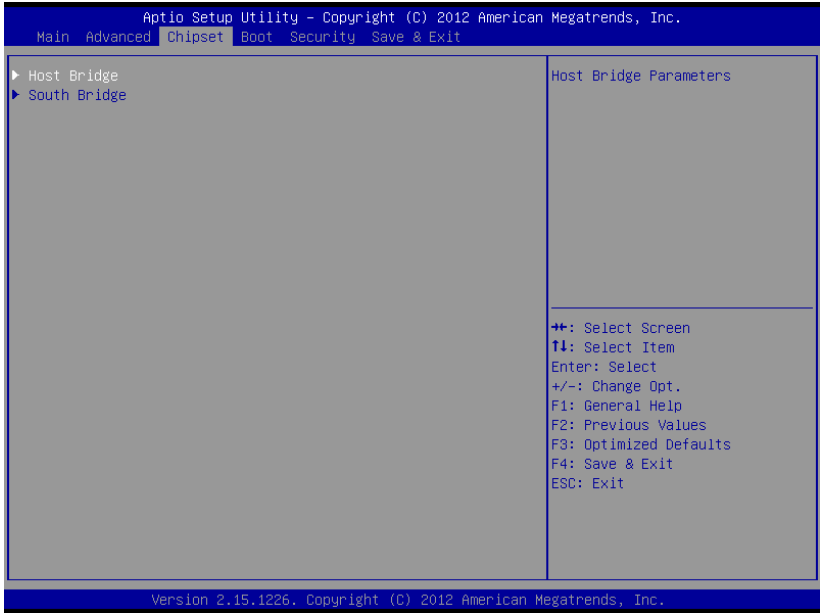
Aptio Setup Utility - Copyright (C) 2012 American Megatrends, Inc.

Advanced

<p>Pc Health Status</p> <pre> CPU temperature : +35 C System temperature : +35 C CPU_VCORE : +1.088 V VCC_DIMM : +1.512 V 3.3V : +3.328 V 3VSB : +3.360 V VBAT : +3.216 V </pre>	<pre> ++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESD: Exit </pre>
--	---

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Setup submenu: Chipset



Options summary: **(default setting)**

Host Bridge		
Host Bridge Parameters		
South Bridge		
South Bridge Parameters		

Host Bridge

```

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Chipset

***** Memory Information *****
Memory Frequency                800 MHz(DDR3)
Total Memory                    2048 MB

Intel IGD Configuration
Fixed Graphics Memory Size      [128MB]

IGFX - Boot Type                [Auto Detect]
LCD Panel Type                 [1024x768  LVDS]
Backlight Control              [Inverted]
LVDS Backlight Level           [ 80%]
Active LFP                     [LVDS]

Configure Fixed Graphics
Memory Size

++: Select Screen
Tl: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESD: Exit

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```

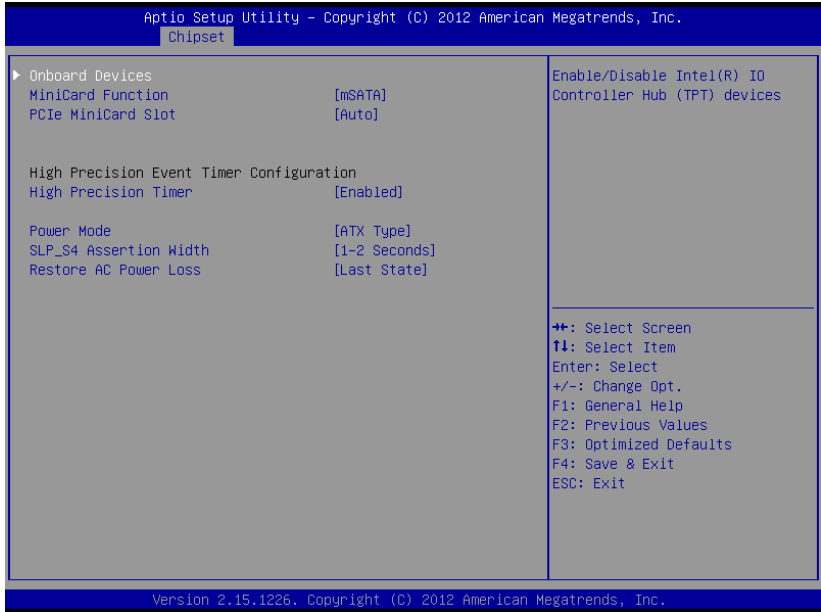
Options summary: *(default setting)*

Fixed Graphics Memory	128MB	
Size	256MB	
Configure Fixed Graphics Memory Size		
IGFX - Boot Type	Auto Detect	
	CRT	
	LVDS	
	HDMI	
Select Primary boot display device		
LVDS Panel Type	640x480	

	800x600	
	1024x768	
	1280x768	
	1366x768	
Select panel native resolution. Note: Only support 18-bit panels		
Backlight Control	Normal	
	Inverted	
Select Backlight control type.		
Inverted: Brightest for low PWM duty cycle and voltage.		
Normal: Brightest for high PWM duty cycle and voltage.		
LVDS Backlight Level	100%	
	90%	
	80%	
	70%	
	60%	
	50%	
	40%	
	30%	
	20%	
	10%	
	0%	
Select Backlight Level		
Active LFP	No LVDS	
	LVDS	

Select the Active LFP Configuration

South Bridge



Options summary: (**default setting**)

Onboard Devices		
Onboard devices parameters configurations		
MiniCard Function	mSATA	
	PCIe	
Switch miniCard function to mSATA or PCIe		
PCIe MiniCard Slot	Auto	
	Enabled	
	Disabled	

Control the PCI Express Root Port.		
High Precision Timer	Enabled	
	Disabled	
Enable or Disable the High Precision Event Timer		
Power Mode	ATX Type	
	AT Type	
Select the power type used on the system		
SLP_S4 Assertion Width	1-2 Seconds	
	2-3 Seconds	
	3-4 Seconds	
	4-5 Seconds	
Select a minimum assertion width of the SLP_S4# signal		
Restore AC Power Loss	Power On	
	Power Off	
	Last State	
Select AC power state when power is re-applied after a power failure.		

Onboard Devices

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Chipset

Azalia Controller	[HD Audio]	Azalia Controller
LAN Controller	[Enabled]	
SMBus Controller	[Enabled]	

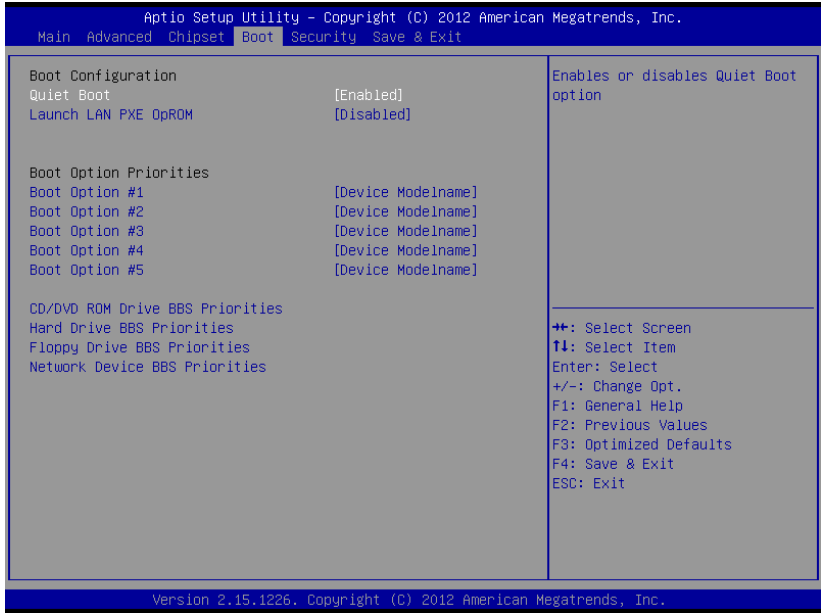
++: Select Screen
 ↑↓: Select Item
 Enter: Select
 +/-: Change Opt.
 F1: General Help
 F2: Previous Values
 F3: Optimized Defaults
 F4: Save & Exit
 ESC: Exit

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Options summary: (**default setting**)

Azalia Controller	Disabled	
	HD Audio	
Enable or disabled Azalia controller		
LAN Controller	Disabled	
	Enabled	
Enable or disable Realtek R8111E PCIE Lan Device		
SMBus Controller	Disabled	
	Enabled	
Enable or Disable OnChip SMBus Controller		

Setup submenu: Boot



Options summary: **(default setting)**

Quiet Boot	Disabled	
	Enabled	
En/Disable showing boot logo.		
Launch LAN PXE OpROM	Disabled	
	Enabled	
En/Disable PXE boot for RTL8111E LAN		
Boot Option #X/		
XXXX Drive BBS Priorities		
The order of boot priorities.		

BBS Priorities

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Boot

Boot Option #1	[Device Modelname]	Sets the system boot order
Boot Option #2	[Device Modelname]	
Boot Option #3	[Device Modelname]	
Boot Option #4	[Device Modelname]	
Boot Option #5	[Device Modelname]	
Boot Option #6	[Device Modelname]	

++: Select Screen
 ↑↓: Select Item
 Enter: Select
 +/-: Change Opt.
 F1: General Help
 F2: Previous Values
 F3: Optimized Defaults
 F4: Save & Exit
 ESC: Exit

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Options summary: (**default setting**)

Boot Option #x	Disabled	
	Device name	
Sets the system boot order		

Setup submenu: Security

```

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Main  Advanced  Chipset  Boot  Security  Save & Exit
-----
Password Description
If ONLY the Administrator's password is set,
then this only limits access to Setup and is
only asked for when entering Setup.
If ONLY the User's password is set, then this
is a power on password and must be entered to
boot or enter Setup. In Setup the User will
have Administrator rights.
The password length must be
in the following range:
Minimum length           3
Maximum length          20

Administrator Password
User Password

HDD Security Configuration:
HDD 0:HDD ModelName

Set Administrator Password

++: Select Screen
F1: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

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```

Options summary: **(default setting)**

Administrator Password/	Not set	
User Password		

You can install a Supervisor password, and if you install a supervisor password, you can then install a user password. A user password does not provide access to many of the features in the Setup utility.

Install the Password:

Press Enter on this item, a dialog box appears which lets you enter a password. You can enter no more than six letters or numbers. Press Enter after you have typed in the password. A second dialog box asks you to retype the password for confirmation. Press Enter after you have retyped it correctly. The password is required at boot time, or when the user enters the Setup utility.

Removing the Password:

Highlight this item and type in the current password. At the next dialog box press Enter to disable password protection.

HDD Security

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Security

<p>HDD Password Description :</p> <p>Allows Access to Set, Modify and Clear HardDisk User and Master Passwords. User Password need to be installed for Enabling Security. Master Password can be Modified only when successfully unlocked with Master Password in POST.</p> <p>HDD PASSWORD CONFIGURATION:</p> <pre> Security Supported : Yes Security Enabled : No Security Locked : No Security Frozen : No HDD User Pwd Status : NOT INSTALLED HDD Master Pwd Status : INSTALLED </pre> <p>Set User Password Set Master Password</p>	<pre> ++: Select Screen !l: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESD: Exit </pre>
--	---

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Options summary: (default setting)

Set User Password/	Not set	
Set Master Password		

You can install a Master and User password. Before booting to OS, HDD will be set to frozen state. On S3 resume HDD will be unlocked using the HDD Password we entered while system booting.

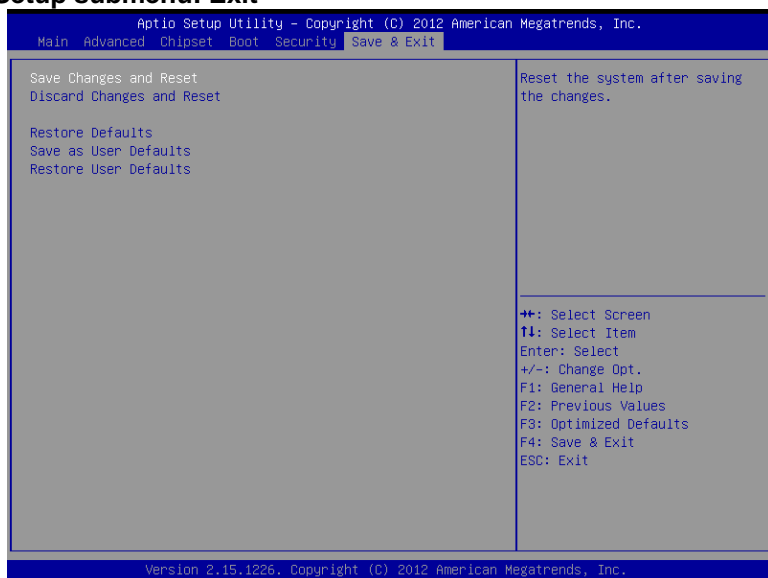
Install the Password:

Press Enter on this item, a dialog box appears which lets you enter a password. You can enter no more than six letters or numbers. Press Enter after you have typed in the password. A second dialog box asks you to retype the password for confirmation. Press Enter after you have retyped it correctly. The password is required at boot time, or when the user enters the Setup utility.

Removing the Password:

Highlight this item and type in the current password. At the next dialog box press Enter to disable password protection.

Setup submenu: Exit

Options summary: (**default setting**)

Save Changes and Reset		
Reset the system after saving the changes		
Discard Changes and Reset		
Reset system setup without saving any changes		
Restore Defaults		
Restore/Load Default values for all the setup options.		
Save as User Defaults		
Save the changes done so far as User Defaults		
Restore User Defaults		
Restore the User Defaults to all the setup options		

Chapter

4

**Driver
Installation**

The PICO-ITX comes with an AutoRun CD-ROM that contains all drivers and utilities that can help you to install the driver automatically.

Insert the driver CD, the driver CD-title will auto start and show the installation guide. If not, please follow the sequence below to install the drivers.

Follow the sequence below to install the drivers:

Step 1 – Install Chipset Driver

Step 2 – Install VGA Driver

Step 3 – Install AHCI Driver

Step 4 – Install LAN Driver

Step 5 – Install Audio Driver

Step 6 – Bluetooth 3.0 & WiFi (option)

Step 7 – Serial Port Driver (Optional)

Please read instructions below for further detailed installations.

4.1 Installation:

Insert the PICO-CV01 CD-ROM into the CD-ROM drive. And install the drivers from Step 1 to Step 7 in order.

Step 1 – Install Chipset Driver

1. Click on the **STEP1-CHIPSET** folder and select the OS folder your system is
2. Double click on the **infinst_autol_1034.exe** file located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 2 – Install VGA Driver

1. Click on the **STEP2-VGA** folder and double click on the **Setup.exe** file
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Note 1:

- This motherboard supports VGA and LVDS display devices. In Single Display mode, use the hot keys to switch between VGA to LVDS device or vice versa. By default, press <Ctrl>+<Alt>+<F1> to switch to VGA device and press <Ctrl>+<Alt>+<F3> to switch to LVDS device.

Note 2:

- VGA Driver for Windows® XP is not available for this motherboard.

Step 3 – Install AHCI Driver

Please refer to the Appendix D AHCI Settings

Step 4 – Install LAN Driver

1. Click on the **STEP4-LAN** folder and select the OS folder your system is
2. Double click on the **setup.exe** file located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 5 – Install Audio Driver

1. Click on the **STEP5-AUDIO** folder and select the OS folder your system is
2. Double click on the **Setup.exe** file located in each OS folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 6 – Bluetooth 3.0 & WiFi (optional)

For Window[®] 7:

1. Click on the **STEP6-Bluetooth 3.0 & WiFi(option)** folder and then click the **WIN7_32** folder
2. Click on the **BT_7.4.0.98** folder and double click on the **Bluetooth_Suite_win7.exe** file in the folder to install

Bluetooth driver

3. Follow the instructions that the window shows
4. The system will help you install the driver automatically
5. Back to the previous level and click on the folder of **WLAN/Install_CD**, double click on the **setup.exe** file in the folder to install WiFi driver
6. Follow the instructions that the window shows
7. The system will help you install the driver automatically

For Window[®] XP:

1. Click on the **STEP6-Bluetooth 3.0 & WiFi(option)** folder and then click the **WINXP_32** folder
2. Click on the **BT_7.3.0.130** folder and double click on the **Bluetooth_Suite_XP.exe** file in the folder
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically
5. Back to the previous level and click on the folder of **XP_9.2.0.458Install_CD**, double click on the **setup.exe** file in the folder to install WiFi driver
6. Follow the instructions that the window shows
7. The system will help you install the driver automatically

Step 7 – Serial Port Driver (Optional)

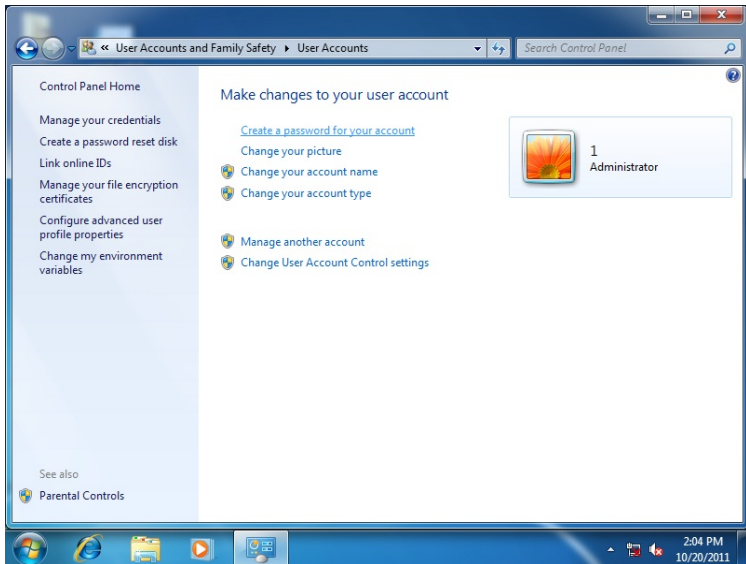
For Windows[®] XP:

1. Click on the **STEP7-Serial Port Driver (Optional)** and select the folder of **WINXP_32**

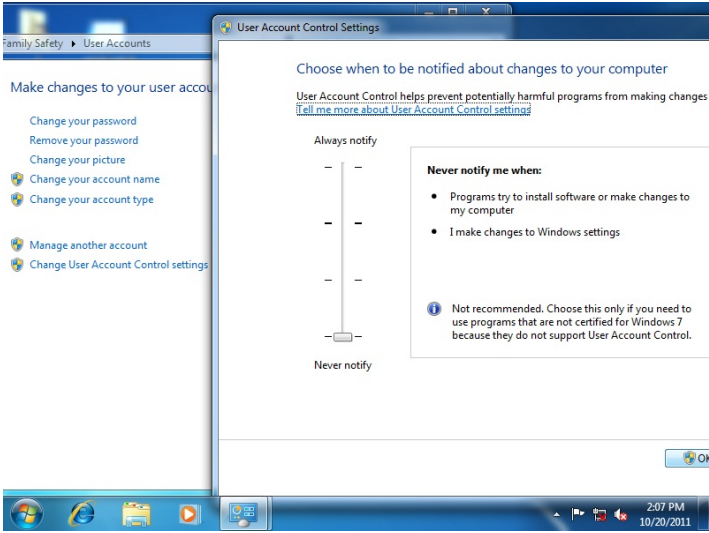
2. Double click on **patch.bat** file
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

For Windows® 7:

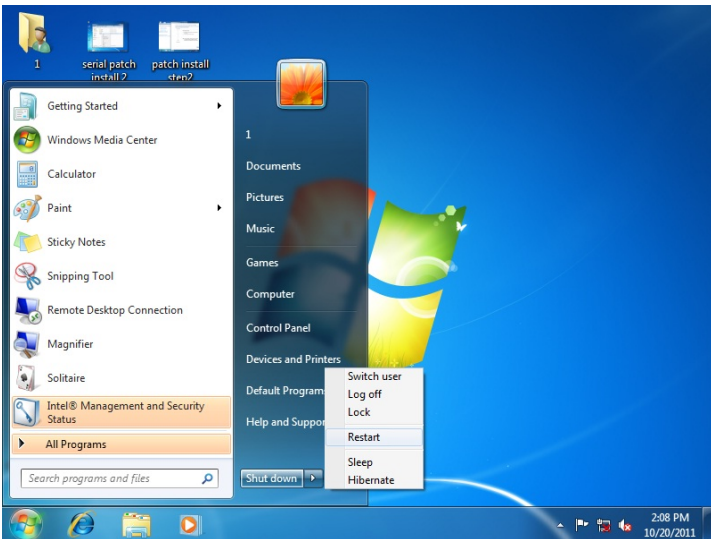
1. Create a password for Administrator account.



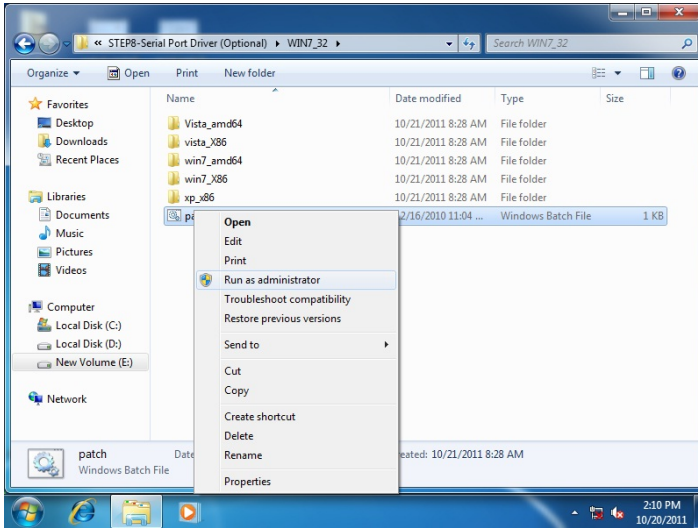
2. Change User Account Control Settings to [Never notify]



3. Reboot and Administrator login.



4. To run patch.bat with [Run as administrator].



Appendix

A

Programming the Watchdog Timer

A.1 Watchdog Timer Registers

Table 1 : Watch dog relative IO address		
	Default Value	Note
I/O Base Address	0xA00	I/O Base address for Watchdog operation. This address is assigned by SIO LDN7, register 0x60-0x61.

Table 2 : Watchdog relative register table				
Register	Offset	BitNum	Value	Note
Watchdog WDTRST# Enable	0x00	7	1	Enable/Disable time out output via WDTRST# 0: Disable 1: Enable
Pulse Width	0x05	0:1	01	Width of Pulse signal 00: 1ms (do not use) 01: 25ms 10: 125ms 11: 5s Pulse width is must longer then 16ms.
Signal Polarity	0x05	2	0	0: low active 1: high active Must set this bit to 0
Counting Unit	0x05	3	0	Select time unit. 0: second 1: minute
Output Signal Type	0x05	4	1	0: Level 1: Pulse Must set this bit to 1
Watchdog Timer Enable	0x05	5	1	0: Disable 1: Enable
Timeout Status	0x05	6	1	1: timeout occurred. Write a 1 to clear timeout status
Timer Counter	0x06			Time of watchdog timer (0~255)

A.2 WatchDog Sample Program

```

*****
// WDT I/O operation relative definition (Please reference to Table 1)
#define WDTAddr      0xA00 // WDT I/O base address
Void WDTWriteByte(byte Register, byte Value);
byte WDTReadByte(byte Register);
Void WDTSetReg(byte Register, byte Bit, byte Val);
// Watch Dog relative definition (Please reference to Table 2)
#define DevReg       0x00 // Device configuration register
    #define WDTRstBit 0x80 // Watchdog WDTRST# (Bit7)
    #define WDTRstVal 0x80 // Enabled WDTRST#
#define TimerReg     0x05 // Timer register
    #define PSWidthBit 0x00 // WDTRST# Pulse width (Bit0:1)
    #define PSWidthVal 0x01 // 25ms for WDTRST# pulse
    #define PolarityBit 0x02 // WDTRST# Signal polarity (Bit2)
    #define PolarityVal 0x00 // Low active for WDTRST#
    #define UnitBit     0x03 // Unit for timer (Bit3)
    #define ModeBit     0x04 // WDTRST# mode (Bit4)
    #define ModeVal     0x01 // 0:level 1: pulse
    #define EnableBit   0x05 // WDT timer enable (Bit5)
    #define EnableVal   0x01 // 1: enable
    #define StatusBit   0x06 // WDT timer status (Bit6)
#define CounterReg   0x06 // Timer counter register
*****

*****
VOID Main(){
    // Procedure : AaeonWDTConfig
    // (byte)Timer : Counter of WDT timer.(0x00~0xFF)
    // (boolean)Unit : Select time unit(0: second, 1: minute).
    AaeonWDTConfig(Counter, Unit);

    // Procedure : AaeonWDTEnable
    // This procedure will enable the WDT counting.

```

```

    AaeonWDTEnable();
}
*****

*****

// Procedure : AaeonWDTEnable
VOID AaeonWDTEnable (){
    WDTEnableDisable(1);
}

// Procedure : AaeonWDTConfig
VOID AaeonWDTConfig (byte Counter, BOOLEAN Unit){
    // Disable WDT counting
    WDTEnableDisable(0);
    // Clear Watchdog Timeout Status
    WDTClearTimeoutStatus();
    // WDT relative parameter setting
    WDTParameterSetting(Timer, Unit);
}

VOID WDTEnableDisable(byte Value){
    If (Value == 1)
        WDTSetBit(TimerReg, EnableBit, 1);
    else
        WDTSetBit(TimerReg, EnableBit, 0);
}

VOID WDTParameterSetting(byte Counter, BOOLEAN Unit){
    // Watchdog Timer counter setting
    WDTWriteByte(CounterReg, Counter);
    // WDT counting unit setting
    WDTSetBit(TimerReg, UnitBit, Unit);
    // WDT output mode set to pulse
    WDTSetBit(TimerReg, ModeBit, ModeVal);
    // WDT output mode set to active low
    WDTSetBit(TimerReg, PolarityBit, PolarityVal);
    // WDT output pulse width is 25ms

```



```

WDTSetBit(TimerReg, PSWidthBit, PSWidthVal);
// Watchdog WDTRST# Enable
WDTSetBit(DevReg, WDTRstBit, WDTRstVal);
}

VOID WDTClearTimeoutStatus(){
    WDTSetBit(TimerReg, StatusBit, 1);
}
*****

*****

VOID WDTWriteByte(byte Register, byte Value){
    IOWriteByte(WDTAddr+Register, Value);
}

byte WDTReadByte(byte Register){
    return IOReadByte(WDTAddr+Register);
}

VOID WDTSetBit(byte Register, byte Bit, byte Val){
    byte TmpValue;

    TmpValue = WDTReadByte(Register);
    TmpValue &= ~(1 << Bit);
    TmpValue |= Val << Bit;
    WDTWriteByte(Register, TmpValue);
}
*****

```


























Appendix

B

I/O Information

B.1 I/O Address Map

Input/output (IO)	
[00000000 - 0000001F]	Direct memory access controller
[00000000 - 00000CF7]	PCI bus
[00000010 - 0000001F]	Motherboard resources
[00000020 - 00000021]	Programmable interrupt controller
[00000022 - 0000003F]	Motherboard resources
[00000024 - 00000025]	Programmable interrupt controller
[00000028 - 00000029]	Programmable interrupt controller
[0000002C - 0000002D]	Programmable interrupt controller
[0000002E - 0000002F]	Motherboard resources
[00000030 - 00000031]	Programmable interrupt controller
[00000034 - 00000035]	Programmable interrupt controller
[00000038 - 00000039]	Programmable interrupt controller
[0000003C - 0000003D]	Programmable interrupt controller
[00000040 - 00000043]	System timer
[00000044 - 0000005F]	Motherboard resources
[0000004E - 0000004F]	Motherboard resources
[00000050 - 00000053]	System timer
[00000060 - 00000060]	Standard PS/2 Keyboard
[00000061 - 00000061]	Motherboard resources
[00000062 - 00000063]	Motherboard resources
[00000063 - 00000063]	Motherboard resources
[00000064 - 00000064]	Standard PS/2 Keyboard
[00000065 - 00000065]	Motherboard resources
[00000065 - 0000006F]	Motherboard resources
[00000067 - 00000067]	Motherboard resources
[00000070 - 00000070]	Motherboard resources
[00000070 - 00000077]	System CMOS/real time clock
[00000072 - 0000007F]	Motherboard resources
[00000080 - 00000080]	Motherboard resources
[00000080 - 00000080]	Motherboard resources
[00000081 - 00000091]	Direct memory access controller
[00000084 - 00000086]	Motherboard resources
[00000088 - 00000088]	Motherboard resources
[0000008C - 0000008E]	Motherboard resources
[00000090 - 0000009F]	Motherboard resources
[00000092 - 00000092]	Motherboard resources
[00000093 - 0000009F]	Direct memory access controller
[000000A0 - 000000A1]	Programmable interrupt controller
[000000A2 - 000000BF]	Motherboard resources
[000000A4 - 000000A5]	Programmable interrupt controller
[000000A8 - 000000A9]	Programmable interrupt controller
[000000AC - 000000AD]	Programmable interrupt controller
[000000B0 - 000000B1]	Programmable interrupt controller
[000000B2 - 000000B3]	Motherboard resources
[000000B4 - 000000B5]	Programmable interrupt controller
[000000B8 - 000000B9]	Programmable interrupt controller
[000000BC - 000000BD]	Programmable interrupt controller


























































	[00000C0 - 00000DF] Direct memory access controller
	[00000E0 - 00000EF] Motherboard resources
	[00000F0 - 00000F0] Numeric data processor
	[000002F8 - 000002FF] Communications Port (COM2)
	[000003B0 - 000003BB] Intel(R) Graphics Media Accelerator 3600 Series
	[000003C0 - 000003DF] Intel(R) Graphics Media Accelerator 3600 Series
	[000003F8 - 000003FF] Communications Port (COM1)
	[00000400 - 0000047F] Motherboard resources
	[00000400 - 0000047F] Motherboard resources
	[000004D0 - 000004D1] Motherboard resources
	[000004D0 - 000004D1] Programmable interrupt controller
	[00000500 - 0000053F] Motherboard resources
	[00000500 - 0000057F] Motherboard resources
	[00000600 - 0000061F] Motherboard resources
	[00000680 - 0000069F] Motherboard resources
	[000006A0 - 000006AF] Motherboard resources
	[000006B0 - 000006EF] Motherboard resources
	[00000A00 - 00000A0F] Motherboard resources
	[00000A10 - 00000A1F] Motherboard resources
	[00000D00 - 0000FFFF] PCI bus
	[00001000 - 0000100F] Motherboard resources
	[0000E000 - 0000E0FF] Realtek PCIe GBE Family Controller
	[0000E000 - 0000EFFF] Intel(R) N10/ICH7 Family PCI Express Root Port - 27D0
	[0000F000 - 0000F01F] Intel(R) N10/ICH7 Family SMBus Controller - 27DA
	[0000F020 - 0000F02F] Intel(R) ICH7R/DH SATA AHCI Controller

B.2 Memory Address Map

Memory	
[00000000 - 00000FFF]	Motherboard resources
[00000000 - 00000FFF]	Motherboard resources
[00000000 - 00003FFF]	Motherboard resources
[000A0000 - 000BFFFF]	Intel(R) Graphics Media Accelerator 3600 Series
[000A0000 - 000BFFFF]	PCI bus
[000C0000 - 000DFFFF]	PCI bus
[000E0000 - 000EFFFF]	PCI bus
[000F0000 - 000FFFFFF]	PCI bus
[7F800000 - 7FFFFFFF]	PCI bus
[80000000 - FEBFFFFFF]	PCI bus
[DFD00000 - DFDFFFFFF]	Intel(R) Graphics Media Accelerator 3600 Series
[DFE00000 - DFE03FFF]	Realtek PCIe GBE Family Controller
[DFE00000 - DFEFFFFFF]	Intel(R) N10/ICH7 Family PCI Express Root Port - 27D0
[DFE04000 - DFE04FFF]	Realtek PCIe GBE Family Controller
[DFF00000 - DFF03FFF]	High Definition Audio Controller
[DFF04000 - DFF043FFF]	Intel(R) ICH7R/DH SATA AHCI Controller
[DFF05000 - DFF053FFF]	Intel(R) N10/ICH7 Family USB2 Enhanced Host Controller - 27CC
[E0000000 - EFFFFFFF]	System board
[FEC00000 - FEC00FFF]	Motherboard resources
[FED00000 - FED003FFF]	High precision event timer
[FED14000 - FED19FFF]	System board
[FED1C000 - FED1FFFF]	Motherboard resources
[FED1C000 - FED1FFFF]	Motherboard resources
[FED20000 - FED8FFFF]	Motherboard resources
[FED45000 - FED8FFFF]	Motherboard resources
[FEE00000 - FEE00FFF]	Motherboard resources
[FF000000 - FFFFFFFF]	Intel(R) 82802 Firmware Hub Device
[FF000000 - FFFFFFFF]	Intel(R) 82802 Firmware Hub Device
[FFC00000 - FFFFFFFF]	Motherboard resources

B.3 IRQ Mapping Chart

Interrupt request (IRQ)	
(ISA) 0x00000000 (00)	System timer
(ISA) 0x00000001 (01)	Standard PS/2 Keyboard
(ISA) 0x00000003 (03)	Communications Port (COM2)
(ISA) 0x00000004 (04)	Communications Port (COM1)
(ISA) 0x00000008 (08)	System CMOS/real time clock
(ISA) 0x0000000C (12)	Microsoft PS/2 Mouse
(ISA) 0x0000000D (13)	Numeric data processor
(ISA) 0x00000051 (81)	Microsoft ACPI-Compliant System
(ISA) 0x00000052 (82)	Microsoft ACPI-Compliant System
(ISA) 0x00000053 (83)	Microsoft ACPI-Compliant System
(ISA) 0x00000054 (84)	Microsoft ACPI-Compliant System
(ISA) 0x00000055 (85)	Microsoft ACPI-Compliant System
(ISA) 0x00000056 (86)	Microsoft ACPI-Compliant System
(ISA) 0x00000057 (87)	Microsoft ACPI-Compliant System
(ISA) 0x00000058 (88)	Microsoft ACPI-Compliant System
(ISA) 0x00000059 (89)	Microsoft ACPI-Compliant System
(ISA) 0x0000005A (90)	Microsoft ACPI-Compliant System
(ISA) 0x0000005B (91)	Microsoft ACPI-Compliant System
(ISA) 0x0000005C (92)	Microsoft ACPI-Compliant System
(ISA) 0x0000005D (93)	Microsoft ACPI-Compliant System
(ISA) 0x0000005E (94)	Microsoft ACPI-Compliant System
(ISA) 0x0000005F (95)	Microsoft ACPI-Compliant System
(ISA) 0x00000060 (96)	Microsoft ACPI-Compliant System
(ISA) 0x00000061 (97)	Microsoft ACPI-Compliant System
(ISA) 0x00000062 (98)	Microsoft ACPI-Compliant System
(ISA) 0x00000063 (99)	Microsoft ACPI-Compliant System
(ISA) 0x00000064 (100)	Microsoft ACPI-Compliant System
(ISA) 0x00000065 (101)	Microsoft ACPI-Compliant System
(ISA) 0x00000066 (102)	Microsoft ACPI-Compliant System
(ISA) 0x00000067 (103)	Microsoft ACPI-Compliant System
(ISA) 0x00000068 (104)	Microsoft ACPI-Compliant System
(ISA) 0x00000069 (105)	Microsoft ACPI-Compliant System
(ISA) 0x0000006A (106)	Microsoft ACPI-Compliant System
(ISA) 0x0000006B (107)	Microsoft ACPI-Compliant System
(ISA) 0x0000006C (108)	Microsoft ACPI-Compliant System
(ISA) 0x0000006D (109)	Microsoft ACPI-Compliant System
(ISA) 0x0000006E (110)	Microsoft ACPI-Compliant System
(ISA) 0x0000006F (111)	Microsoft ACPI-Compliant System
(ISA) 0x00000070 (112)	Microsoft ACPI-Compliant System
(ISA) 0x00000071 (113)	Microsoft ACPI-Compliant System
(ISA) 0x00000072 (114)	Microsoft ACPI-Compliant System
(ISA) 0x00000073 (115)	Microsoft ACPI-Compliant System
(ISA) 0x00000074 (116)	Microsoft ACPI-Compliant System
(ISA) 0x00000075 (117)	Microsoft ACPI-Compliant System
(ISA) 0x00000076 (118)	Microsoft ACPI-Compliant System
(ISA) 0x00000077 (119)	Microsoft ACPI-Compliant System
(ISA) 0x00000078 (120)	Microsoft ACPI-Compliant System
(ISA) 0x00000079 (121)	Microsoft ACPI-Compliant System
(ISA) 0x0000007A (122)	Microsoft ACPI-Compliant System
(ISA) 0x0000007B (123)	Microsoft ACPI-Compliant System
(ISA) 0x0000007C (124)	Microsoft ACPI-Compliant System
(ISA) 0x0000007D (125)	Microsoft ACPI-Compliant System
(ISA) 0x0000007E (126)	Microsoft ACPI-Compliant System
(ISA) 0x0000007F (127)	Microsoft ACPI-Compliant System
(ISA) 0x00000080 (128)	Microsoft ACPI-Compliant System
(ISA) 0x00000081 (129)	Microsoft ACPI-Compliant System
(ISA) 0x00000082 (130)	Microsoft ACPI-Compliant System

	(ISA) 0x00000083 (131)	Microsoft ACPI-Compliant System
	(ISA) 0x00000084 (132)	Microsoft ACPI-Compliant System
	(ISA) 0x00000085 (133)	Microsoft ACPI-Compliant System
	(ISA) 0x00000086 (134)	Microsoft ACPI-Compliant System
	(ISA) 0x00000087 (135)	Microsoft ACPI-Compliant System
	(ISA) 0x00000088 (136)	Microsoft ACPI-Compliant System
	(ISA) 0x00000089 (137)	Microsoft ACPI-Compliant System
	(ISA) 0x0000008A (138)	Microsoft ACPI-Compliant System
	(ISA) 0x0000008B (139)	Microsoft ACPI-Compliant System
	(ISA) 0x0000008C (140)	Microsoft ACPI-Compliant System
	(ISA) 0x0000008D (141)	Microsoft ACPI-Compliant System
	(ISA) 0x0000008E (142)	Microsoft ACPI-Compliant System
	(ISA) 0x0000008F (143)	Microsoft ACPI-Compliant System
	(ISA) 0x00000090 (144)	Microsoft ACPI-Compliant System
	(ISA) 0x00000091 (145)	Microsoft ACPI-Compliant System
	(ISA) 0x00000092 (146)	Microsoft ACPI-Compliant System
	(ISA) 0x00000093 (147)	Microsoft ACPI-Compliant System
	(ISA) 0x00000094 (148)	Microsoft ACPI-Compliant System
	(ISA) 0x00000095 (149)	Microsoft ACPI-Compliant System
	(ISA) 0x00000096 (150)	Microsoft ACPI-Compliant System
	(ISA) 0x00000097 (151)	Microsoft ACPI-Compliant System
	(ISA) 0x00000098 (152)	Microsoft ACPI-Compliant System
	(ISA) 0x00000099 (153)	Microsoft ACPI-Compliant System
	(ISA) 0x0000009A (154)	Microsoft ACPI-Compliant System
	(ISA) 0x0000009B (155)	Microsoft ACPI-Compliant System
	(ISA) 0x0000009C (156)	Microsoft ACPI-Compliant System
	(ISA) 0x0000009D (157)	Microsoft ACPI-Compliant System
	(ISA) 0x0000009E (158)	Microsoft ACPI-Compliant System
	(ISA) 0x0000009F (159)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A0 (160)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A1 (161)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A2 (162)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A3 (163)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A4 (164)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A5 (165)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A6 (166)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A7 (167)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A8 (168)	Microsoft ACPI-Compliant System
	(ISA) 0x000000A9 (169)	Microsoft ACPI-Compliant System
	(ISA) 0x000000AA (170)	Microsoft ACPI-Compliant System
	(ISA) 0x000000AB (171)	Microsoft ACPI-Compliant System
	(ISA) 0x000000AC (172)	Microsoft ACPI-Compliant System
	(ISA) 0x000000AD (173)	Microsoft ACPI-Compliant System
	(ISA) 0x000000AE (174)	Microsoft ACPI-Compliant System
	(ISA) 0x000000AF (175)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B0 (176)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B1 (177)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B2 (178)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B3 (179)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B4 (180)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B5 (181)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B6 (182)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B7 (183)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B8 (184)	Microsoft ACPI-Compliant System
	(ISA) 0x000000B9 (185)	Microsoft ACPI-Compliant System
	(ISA) 0x000000BA (186)	Microsoft ACPI-Compliant System
	(ISA) 0x000000BB (187)	Microsoft ACPI-Compliant System
	(ISA) 0x000000BC (188)	Microsoft ACPI-Compliant System
	(ISA) 0x000000BD (189)	Microsoft ACPI-Compliant System
	(ISA) 0x000000BE (190)	Microsoft ACPI-Compliant System
	(PCI) 0x00000007 (007)	Intel(R) N10/ICH7 Family SMBus Controller - 27DA
	(PCI) 0x00000010 (16)	Intel(R) N10/ICH7 Family PCI Express Root Port - 27D0
	(PCI) 0x00000010 (16)	Intel(R) N10/ICH7 Family USB Universal Host Controller - 27CB

B.4 DMA Channel Assignments



Direct memory access (DMA)



4 Direct memory access controller

Appendix

C

Mating Connector

C.1 List of Mating Connectors and Cables

The table notes mating connectors and available cables.

Connector Label	Function	Mating Connector		Available Cable	Cable P/N
		Vendor	Model number		
CN1	COM1 Port	CATCH	1201-700-09S	Serial Port Cable	1701090150
CN2	COM2 Port	CATCH	1201-700-09S	Serial Port Cable	1701090150
CN3	Digital I/O	CATCH	1201-700-06S	AAEON DIO Extension Cable	1701060150
CN4	+5V Output for SATA HDD	CATCH	1192-700-02S	2 Pins for SATA PWR Cable	1702150155
CN5	SATA Port	ASTRON	97-0912HA-7-R	7-Pin 50cm SATA Cable	1709070500
CN6	External 12V Input	CATCH	1191-700-04S	PWR Cable	170204010S
CN7	RJ-45 Ethernet	UDE	RT7-17FAAM1A	N/A	N/A
CN8	Buzzer	CATCH	1201-700-02S	Buzzer Cable	170302010C
CN9	Audio Line In/Out and MIC Connector	CATCH	1201-700-10S	Audio Cable	1709100254
CN10	LPC Expansion I/F	CATCH	1204-700-12S	AAEON LPC Cable	1703120130

PICO-ITX Board**PICO-CV01**

CN11	USB Port 5	CATCH	1201-700-05S	USB Port Cable	1700050207
CN12	Analog CRT Display	ASTRON	HDLH-B15-CF HN1T-1-R	N/A	N/A
CN13	USB Port 3	CATCH	1201-700-05S	USB Port Cable	1700050207
CN14	USB Port 4	CATCH	1201-700-05S	USB Port Cable	1700050207
CN15	18-bit LVDS Output	E-Call	0110-01-553-200	N/A	N/A
CN16	USB Port 1 and 2	TechBest	KS-002D-ANB(2.0)-L	N/A	N/A
CN17	HDMI Type C	ASTRON	360FC19-0N002T-R	N/A	N/A
CN18	LVDS Inverter/ Backlight Connector	CATCH	1192-700-05S	N/A	N/A
CN19	Front Panel	JVE	21B22050-XXS 10B-01G-4/2	AAEON Front Panel Cable	1701100156
BAT1	External RTC Battery Connector	CATCH	1201-700-02S	Battery Cable	175011901 M

Appendix

D

AHCI Settings

D.1 Setting AHCI

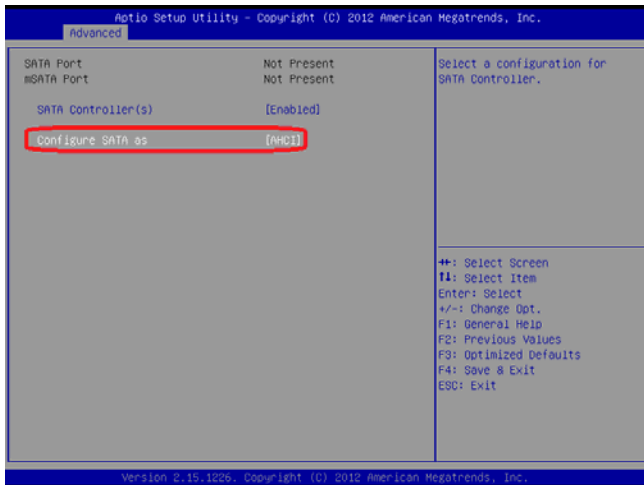
OS installation to SETUP AHCI Mode

Step 1: Copy below files from “Driver CD -> Step3 - AHCIWinXP_32” and to diskette.

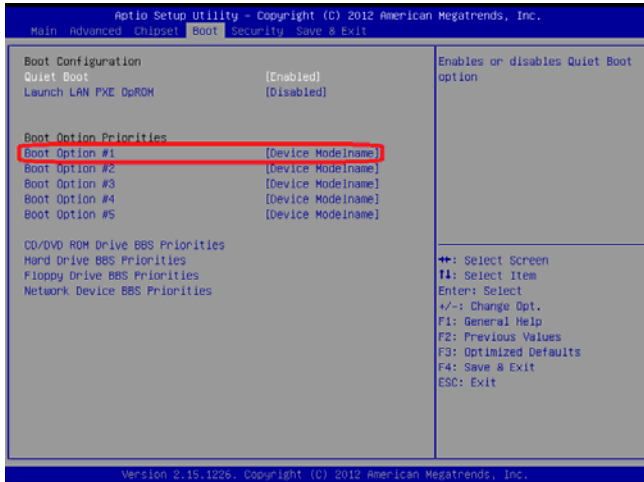


Step 2: Connect the USB Floppy drive to the board and insert the diskette from previous step.

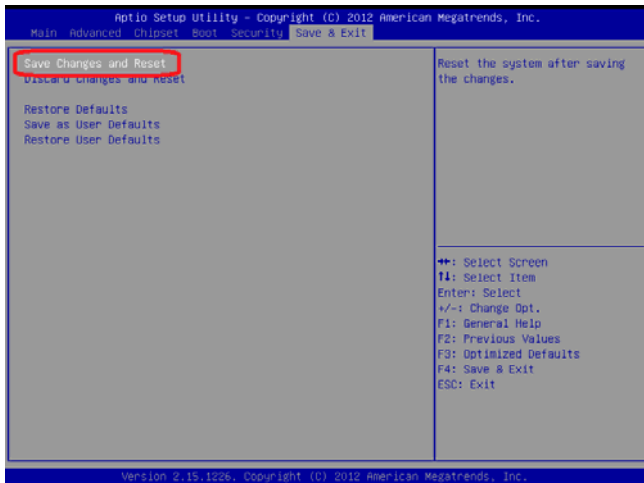
Step 3: Configure SATA Controller to RAID mode in **BIOS SETUP Menu: Advanced -> IDE Configuration -> SATA Mode -> AHCI Mode**



Step 4: Configure DVD/CD-ROM drive as the first boot device.



Step 5: Save changes and exit BIOS SETUP

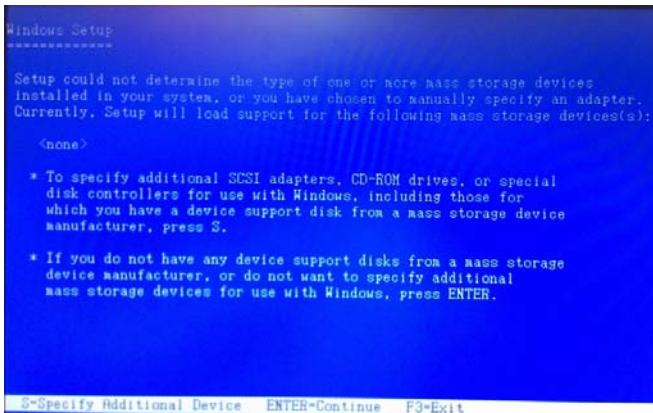


Step 6 – Boot to DVD/CD-ROM device to install OS

Step 7 – Press “F6” to install AHCI driver



Step 8 – Press “S” to install AHCI driver



Step 9 – Choose “Intel(R) ICH7R/DH SATA AHCI Controller”

Step 10 – Windows Setup will display the controller name you selected in previous step and continue to install OS when “ENTER” pressed.

Appendix

E

Electrical Specifications for I/O Ports

E.1 Electrical Specifications for Digital I/O Ports

Table 1 : Digital Input/Output Pin Electrical Specification						
Pin	Type	Input Threshold Voltage		Output Voltage		Note
		Low	High	Low	High	
DIO1	I/O	0.8	2.0	0	3.3	
DIO2	I/O	0.8	2.0	0	3.3	
DIO3	I/O	0.8	2.0	0	3.3	
DIO4	I/O	0.8	2.0	0	3.3	

Note: All DIO pins are 5V tolerance in input mode.

E.2 DIO Programming

PICO-CV01 utilizes FINTEK F81801U chipset as its Digital I/O controller. Below are the procedures to complete its configuration and the AAEMON initial DIO program is also attached based on which you can develop customized program to fit your application. There are three steps to complete the configuration setup: (1) Enter the MB PnP Mode; (2) Modify the data of configuration registers; (3) Exit the MB PnP Mode. Undesired result may occur if the MB PnP Mode is not exited normally.

E.3 Digital I/O Register

	Default Value	Note
Index	0x2E	SIO MB PnP Mode Index Register 0x2E or 0x4E
Data	0x2F)	SIO MB PnP Mode Data Register 0x2F or 0x4F

	LDN	Register	BitNum	Note
GPIO1 Direction	0x06	0xD0	0	0:input, 1: output
GPIO2 Direction	0x06	0xD0	1	
GPIO3 Direction	0x06	0xD0	2	
GPIO4 Direction	0x06	0xD0	3	
GPIO1 Output Level	0x06	0xD1	0	0:low, 1: high
GPIO2 Output Level	0x06	0xD1	1	
GPIO3 Output Level	0x06	0xD1	2	
GPIO4 Output Level	0x06	0xD1	3	
GPIO1 Status	0x06	0xD2	0	0:low, 1: high
GPIO2 Status	0x06	0xD2	1	
GPIO3 Status	0x06	0xD2	2	
GPIO4 Status	0x06	0xD2	3	

E.4 Digital I/O Sample Program

```

*****
// SuperIO relative definition (Please reference to Table 2)
#define SIOIndex 0x2E
#define SIOData 0x2F
#define DIOLDN 0x06
IOWriteByte(byte IOPort, byte Value);
IOReadByte(byte IOPort);
// DIO relative definition (Please reference to Table 3)
#define DirReg 0xD0 // 0:input, 1: output
    #define InputPin 0x00
    #define OutputPin 0x01
#define OutputReg 0xD1 // 0:low, 1: high
#define StatusReg 0xD2 // 0:low, 1: high
    #define PinLow 0x00
    #define PinHigh 0x01
#define Pin1Bit 0x00
#define Pin2Bit 0x01
#define Pin3Bit 0x02
#define Pin4Bit 0x03
*****

*****
VOID Main(){
    Boolean PinStatus ;

    // Procedure : AaeonReadPinStatus
    // Input :
    //     Example, Read Digital I/O Pin 3 status
    // Output :
    //     InputStatus :
    //         0: Digital I/O Pin level is low
    //         1: Digital I/O Pin level is High
    PinStatus = AaeonReadPinStatus(Pin3Bit);
}

```

```

// Procedure : AaeonSetOutputLevel
// Input :
// Example, Set Digital I/O Pin 2 to high level
AaeonSetOutputLevel(Pin2Bit, PinHigh);
}
*****

*****

Boolean AaeonReadPinStatus(byte PinBit){
    Boolean PinStatus ;

    PinStatus = SIOBitRead(DIOLDN, StatusReg, PinBit);
    Return PinStatus ;
}
VOID AaeonSetOutputLevel(byte PinBit, byte Value){
    ConfigDioMode(PinBit, OutputPin);
    SIOBitSet(DIOLDN, OutputReg, PinBit, Value);
}
*****

*****VOI
D SIOEnterMBPnPMode(){
    IOWriteByte(SIOIndex, 0x87);
    IOWriteByte(SIOIndex, 0x87);
}

VOID SIOExitMBPnPMode(){
    IOWriteByte(SIOIndex, 0xAA);
}

VOID SIOSelectLDN(byte LDN){
    IOWriteByte(SIOIndex, 0x07); // SIO LDN Register Offset = 0x07
    IOWriteByte(SIOData, LDN);
}

VOID SIOBitSet(byte LDN, byte Register, byte BitNum, byte Value){
    Byte TmpValue;

```

```
SIOEnterMBPnPMode();
SIOSelectLDN(LDN);
IOWriteByte(SIOIndex, Register);
TmpValue = IOReadByte(SIOData);
TmpValue &= ~(1 << BitNum);
TmpValue |= (Value << BitNum);
IOWriteByte(SIOData, TmpValue);
SIOExitMBPnPMode();
}

VOID SIOByteSet(byte LDN, byte Register, byte Value){
    SIOEnterMBPnPMode();
    SIOSelectLDN(LDN);
    IOWriteByte(SIOIndex, Register);
    IOWriteByte(SIOData, Value);
    SIOExitMBPnPMode();
}
*****
```

```
Boolean SIOBitRead(byte LDN, byte Register, byte BitNum){
    Byte TmpValue;

    SIOEnterMBPnPMode();
    SIOSelectLDN(LDN);
    IOWriteByte(SIOIndex, Register);
    TmpValue = IOReadByte(SIOData);
    TmpValue &= (1 << BitNum);
    SIOExitMBPnPMode();
    If(TmpValue == 0)
        Return 0;
    Return 1;
}
VOID ConfigDioMode(byte PinBit, byte Mode){
    Byte TmpValue;

    SIOEnterMBPnPMode();
    SIOSelectLDN(DIOLDN);
    IOWriteByte(SIOIndex, DirReg);
    TmpValue = IOReadByte(SIOData);
    TmpValue |= (Mode << PinBit);
    IOWriteByte(SIOData, DirReg);
    SIOExitMBPnPMode();
}
*****
```