rBOX510-6COM(ATEX&C1D2)

Robust Din-rail Fanless Embedded System

User's Manual

Reversion History

Version	Updated Date	Updated Reason	Updated page
A1	2015/Jul./ 30	Initial Release	NO

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Safety Precautions

Before getting started, please read the following important safety precautions.

1. The rBOX510-6COM(ATEX&C1D2) does not come equipped with an operating system. An operating system must be loaded first before installing any software into the computer.
2. Be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and place all electronic components in any static-shielded devices. Most electronic components are sensitive to static electrical charge.
3. Disconnect the power cord from the rBOX510-6COM(ATEX&C1D2) before making any installation. Be sure both the system and the external devices are turned OFF. Sudden surge of power could ruin sensitive components. Make sure the rBOX510-6COM(ATEX&C1D2) is properly grounded.
4. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
5. Turn OFF the system power before cleaning. Clean the system using a cloth only. Do not spray any liquid cleaner directly onto the screen.
6. Do not leave this equipment in an uncontrolled environment where the storage temperature is below -45℃ or above 85℃. It may damage the equipment.
7. Start the equipment maintenance and repair after turn OFF the system power for at least 15 miniutes.
8. Replaceable batteries
   "CAUTION: Risk of Explosion if Battery is replaced by an Incorrect Type. Dispose of Used Batteries According to the Instructions."
9. Restricted Access Location
   "Equipment intended for installation in Restricted Access Location" or equivalent. (Instruction)
10. Power source requirement
    "This product is intended to be supplied by a UL Listed Power sourcce marked with "LPS", "Limited Power Source" or "Class 2" and output rated 12-48 Vdc, 1.63-0.45 A min." or equivalent statement provided in operating manual.
11. Do not open the system's back cover. If opening the cover for maintenance is a must, only a trained technician is allowed to do so. Integrated circuits on computer boards are sensitive to static electricity. To avoid damaging chips from electrostatic discharge, observe the following precautions:
    - Before handling a board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. This will help to discharge any static electricity on your body.
    - When handling boards and components, wear a wrist-grounding strap, available from most electronic component stores.

Classification

1. Degree of production against electric shock: not classified
2. Degree of protection against the ingress of water: IP30
3. Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.
4. Mode of operation: Continuous
5. Type of protection against electric shock: Class I equipment

General Cleaning Tips

You may need the following precautions before you begin to clean the computer. When you clean any single part or component for the computer, please read and understand the details below fully.

When you need to clean the device, please rub it with a piece of dry cloth.

1. Be cautious of the tiny removable components when you use a vacuum cleaner to absorb the dirt on the floor.
2. Turn the system off before you start to clean up the component or computer.
3. Never drop the components inside the computer or get circuit board damp or wet.
4. Be cautious of all kinds of cleaning solvents or chemicals when you use it for the sake of cleaning. Some individuals may be allergic to the ingredients.
5. Try not to put any food, drink or cigarette around the computer.

Cleaning Tools

Although many companies have created products to help improve the process of cleaning your computer and peripherals users can also use household items to clean their computers and peripherals. Below is a listing of items you may need or want to use while cleaning your computer or computer peripherals.

Keep in mind that some components in your computer may only be able to be cleaned using a product designed for cleaning that component, if this is the case it will be mentioned in the cleaning.

- Cloth: A piece of cloth is the best tool to use when rubbing up a component. Although paper towels or tissues can be used on most hardware as well, we still recommend you to rub it with a piece of cloth.
- Water or rubbing alcohol: You may moisten a piece of cloth a bit with some water or rubbing alcohol and rub it on the computer. Unknown solvents may be harmful to the plastics parts.
- Vacuum cleaner: Absorb the dust, dirt, hair, cigarette particles, and other particles out of a computer can be one of the best methods of cleaning a computer. Over time these items can restrict the airflow in a computer and cause circuitry to corrode.
- Cotton swabs: Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas in your keyboard, mouse, and other locations.
- Foam swabs: Whenever possible it is better to use lint free swabs such as foam swabs.

***Note: We strongly recommended that you should shut down the system before you start to clean any single components*.**

Please follow the steps below:

1. Close all application programs
2. Close operating software
3. Turn off power
4. Remove all device
5. Pull out power cable

Scrap Computer Recycling

If the computer equipments need the maintenance or are beyond repair, we strongly recommended that you should inform your Axiomtek distributor as soon as possible for the suitable solution. For the computers that are no longer useful or no longer working well, please contact your Axiomtek distributor for recycling and we will make the proper arrangement.

Trademarks Acknowledgments

Table of Contents

CHAPTER 1
INTRODUCTION

This chapter contains general information and detailed specifications of the rBOX510-6COM (ATEX&C1D2). The Chapter 1 includes the following sections:

- General Description
- System Specification
- Dimensions
- I/O Outlets

1.1 General Description

rBOX510-6COM(ATEX&C1D2) Din-rail fanless embedded system is suitable for communications control and for protocol converter applications in critical environments. Built for rugged work environments, rBOX510-6COM(ATEX&C1D2) features an extra low power consumption Intel® ATOM™ E3827 (1.75GHz) processors supporting industrial temperature range of -40℃ to +70℃. Its front accessible I/O cabling is very convenient for wiring and maintenance. rBOX510-6COM(ATEX&C1D2) offers a VGA output, making it particularly well-suited for communication control, SCADA and industrial automation. Its compact size with Din-rail mounting allows for easy installation into control cabinet. Pre-installed with Linux, Windows® 7 embedded and Windows 8 embedded, rBOX510-6COM(ATEX&C1D2) provides programmers with a friendly environment for developing application software at a lower cost.

rBOX510-6COM(ATEX&C1D2) is robust industrial-grade hardware design and adopts the advanced cooling system, besides, supporting the CompactFlash™ and SATA SSD (Solid State Drive), which makes it especially suitable for field control & monitoring system solution for following markets:

Utility Industries (Water; Energy; Chemical Plant; Mining…)

Public Transportation Industries (Traffic/ Highway Control; Train/Bus Control…)

Homeland Security (Weather Monitoring/Alarm System…)

- **Features**
  - Fanless design
  - Wide temperature operation of -40℃ - +70℃
  - Supports 2 10/100/1000 Base-T Ethernets with Magnetic Isolated Protection
  - 4 isolated RS-232/422/485 COM Ports and 2 RS-232/422/485 COM Ports
  - 1 isolated DIO (8-IN/ 8-OUT)
  - Support one 2.5" SATA SSD (Solid State Drive) and one CompactFlash™
  - Wide range 12–48V DC-in with terminal block
  - Din-rail mounting
  - Wall mounting (optional)
  - Passed Heavy Industrial CE, FCC Part 18 and UL testing
  - Passed ATEX & C1D2 Anti-explosive Certification

- **Embedded O.S. Supported**

  rBOX510-6COM(ATEX&C1D2) not only supports Windows® 7 and Windows® 8, but also supports embedded OS, such as Windows® 7 embedded, Windows® 8 embedded and Linux package support. For storage device, rBOX510-6COM(ATEX&C1D2) supports one SATA SSD (Solid State Drive) and one type II CompactFlash™ socket.

1.2 System Specifications

1.2.1 CPU

- Onboard Intel® ATOM™ E3827 (1.75 GHz) processor.

1.2.2 BIOS

- AMI (American Megatrends Inc.) UEFI (Unified Extensible Firmware Interface) BIOS.

1.2.3 System Memory

- Memory down solution w/extended temperature memory chip
- Memory size 4GB onboard

1.2.4 Display

- A slim type 15-pin D-Sub connector as VGA connector.

1.2.5 Ethernet Ports

- LAN 1 and LAN 2

  The board has dual RJ-45 connectors, support 10/100/1000Mbps with 1.5KV magnetic isolated protection.
- Support PXE boot and LAN wake-up

1.2.6 Storages

- 1 x 2.5" SATA SSD (Solid State Drive) (default)
- 1 x CompactFlash TypeII socket

Note: Connecting the SATA+Power SSD cable with Solid State Drive, and the SATA+Power SSD cable needs to be glued by using "LDC737" silicone when connect to the board connector.

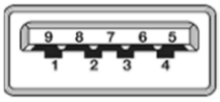
1.2.7 USB

- 1 x USB2.0 & 1 x USB3.0
- It is always plugged-in the USB housing cover (pls refer below picture), excepting equipment maintenance and repair situation. 
- It is used for maintenance and repair only, ex: accesse data by pluggin gin USB flash, or check data & remive wrong data by using USB type of keyboard/mouse.
- With power distribution control and over current protection
- USB Pin Define

Pin	Signal USB 2.0	Pin	Signal USB 3.0
1	VCC	1	VCC
2	D-	2	D-
3	D+	3	D+
4	GND	4	GND
-	-	5	SSRX-
-	-	6	SSRX-
-	-	7	GND
-	-	8	SSTX-
-	-	9	SSTX+

USB2.0

USB 3.0

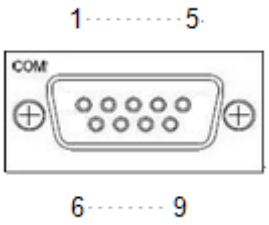


1.2.8 COM

- COM1~COM2 support RS232/RS422/RS485 which can be selected by BIOS.
  COM3~COM6 support RS232/RS422/RS485 which can be selected by BIOS with Isolation 2KV protection.
- Supports Auto Flow Control in RS485 mode.

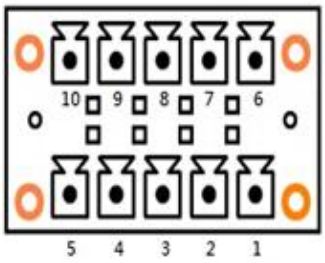
COM1~2

Pin	RS-232	RS-422	RS-485
1	DCD	TX-	Data-
2	RXD	TX+	Data+
3	TXD	RX+	--
4	DTR	RX-	--
5	GND	GND	GND
6	DSR	--	--
7	RTS	--	--
8	CTS	--	--
9	RI	--	--



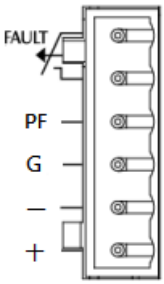
COM3~6

Pin	RS-232	RS-422	RS-485
1,6	RXD	TX+	Data+
2,7	CTS	TX-	Data-
3,8	TXD	RX+	--
4,9	RTS	RX-	--
5,10	ISO_GND	ISO_GND	ISO_GND



1.2.9 Power

Pin	Signal
1	Alarm+
2	Alarm-
3	Power Fail
4	Shield Ground
5	GND
6	PWR



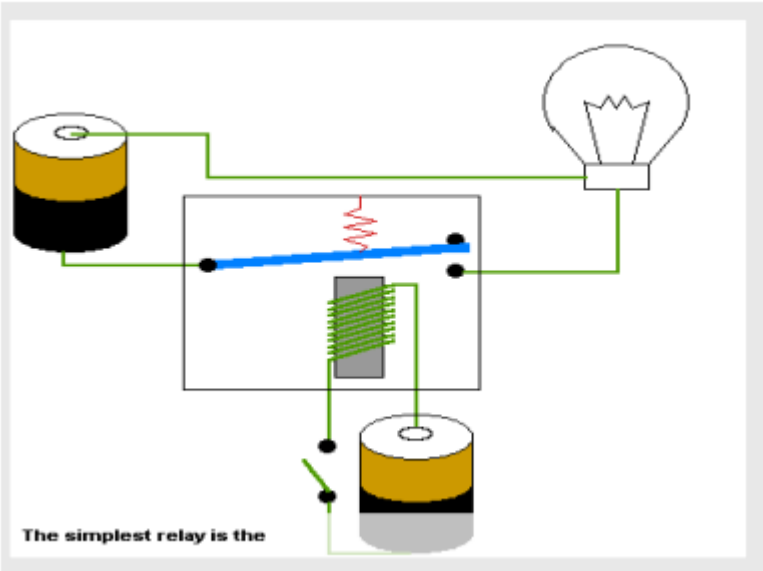
- PF pin must connect to external the power fail of UPS, so can normal shutdown when being abnormal power loss.

  LVCMOS 3.3 Level, VIL: 0.8V, VIH: 2.0~3.6,system internal pull up.
- The relay default function will be enabled when the system cannot normal boot
- One wide-range 12 - 48V DC power input with terminal block.
- OVP, UVP and Reverse protection.

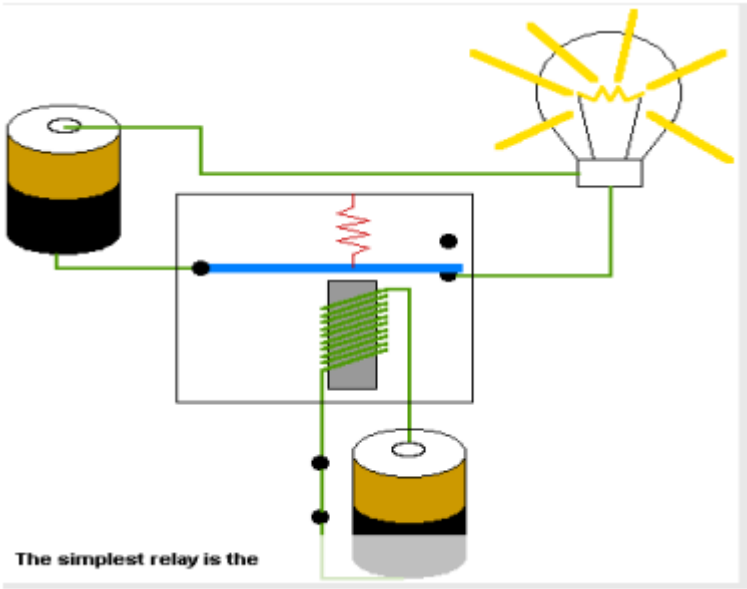
➢ Relay output

Below is a very simple application for remote notice use relay and lamp.

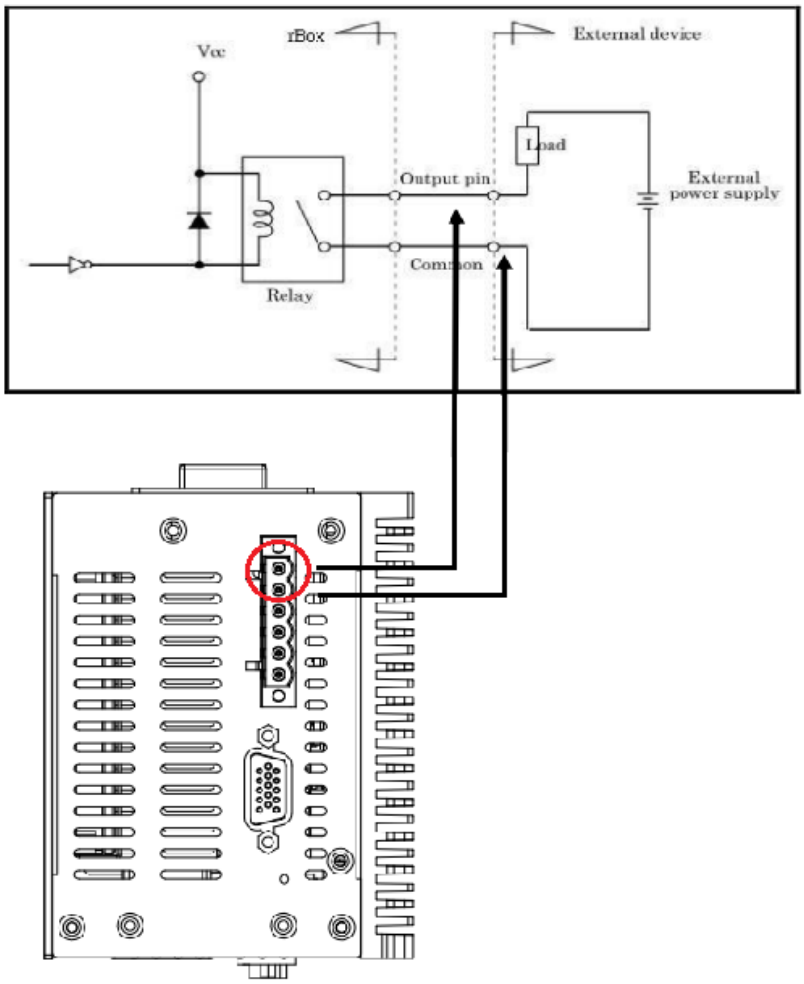
a) Normal



b) Warning



c) Relay wiring of rBox



1.2.10 WatchDog Timer (WDT)

- One step is 1sec, 255 levels
- One step is 1sec/1min, 255 levels.

1.2.11 Digital I/O Connector and Pin Definition

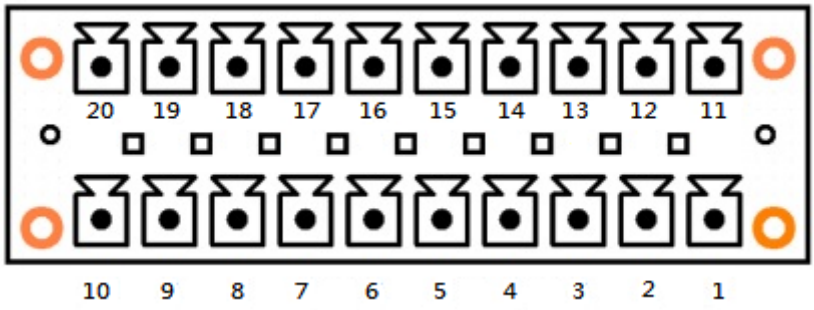
- 8bit DI and 8bit DO
- 3KV optical isolation
- DIO Design Sepcification

Digital Input	
Input Channels	8,source type
Input Voltage	0 to 30VDC Input
Digital Input Levels for Dry Contacts	Logic level 0:Close to GND. Logic level 1:Open
Digital Input Levels for Wet Contacts	Logic level 0:+10V to +24V (DI To XIN_COM-). Logic level 1:+3V max.
Digital Output	
Output Channels	8,sink type
Output Current	Max. 200 mA per channel, current sink type
External voltage	10 to 30VDC , open collector to 30V

- **Remark**

Signal Name	Meaning
COM+	Plus common for Input/ Output Group
COM-	Minus common for Input/Output Group
DIN0~7	Input Group
DOUT0~7	Output Group

- **DIO 8 in/out of TB20 Female**



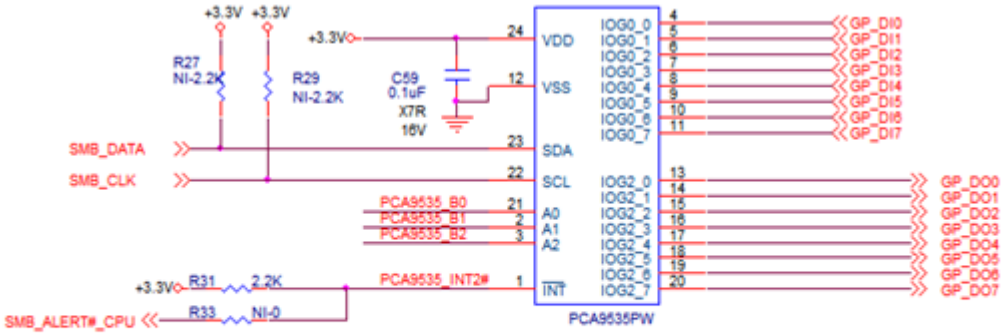
Pin	Function	Pin	Function
1	COM+	11	COM+
2	DI0	12	DO0
3	DI1	13	DO1
4	DI2	14	DO2
5	DI3	15	DO3
6	DI4	16	DO4
7	DI5	17	DO5
8	DI6	18	DO6
9	DI7	19	DO7
10	COM-	20	COM-

SMBus Address & GPIO Pin Define

- SMBus Address : 0b0100100X
- GPIO schematic PIN define

PIN4 → DI0	PIN13 → DO0
PIN5 → DI1	PIN14 → DO1
PIN6 → DI2	PIN15 → DO2
PIN7 → DI3	PIN16 → DO3
PIN8 → DI4	PIN17 → DO4
PIN9 → DI5	PIN18 → DO5
PIN10 → DI6	PIN19 → DO6
PIN11 → DI7	PIN20 → DO7

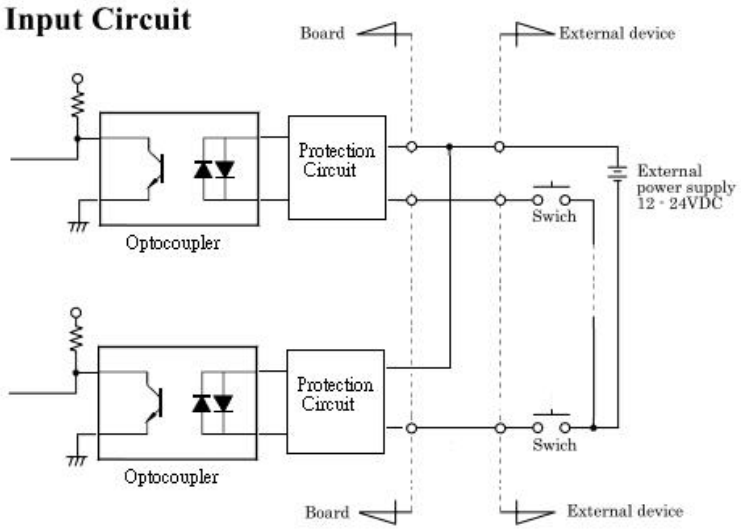
SMBus to GPIO Schematic



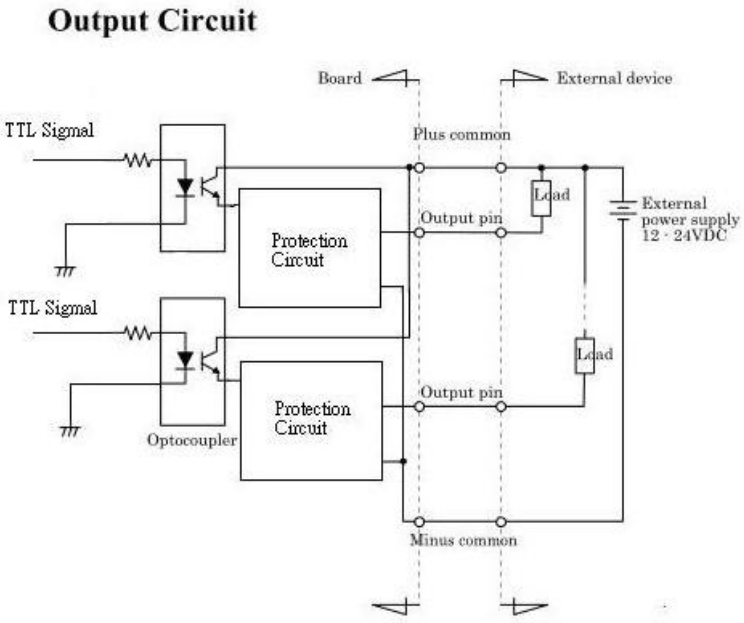
Address : 0x40/41

DIO operation schematic diagram

Reference 1.

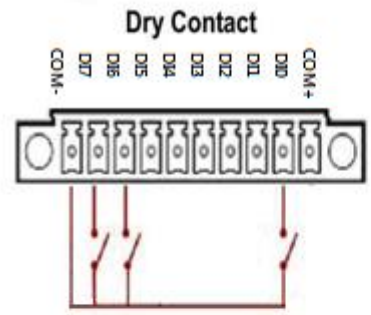


Reference 2.

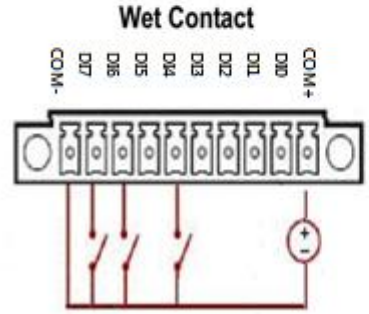


Reference 3

Digital Input Wiring

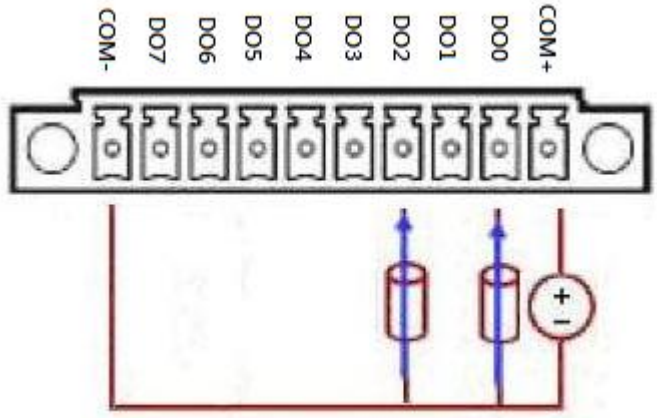


Note: If you are using wet contacts, you must connect **COM** to power.



Reference 4

Digital Output Wiring

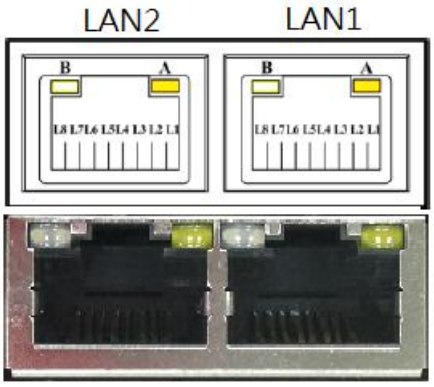


1.2.12 Ethernet Ports

- **LAN 1 and LAN 2**

  The board has dual RJ-45 ethernet connector which using Intel I210-IT ethernet controllers, support 1000/100/10-Base transmit rate and with 1.5KV magnetic isolated protection.

Pin	Signal	
L1	MDI0+	
L2	MDI0-	
L3	MDI1+	
L4	MDI1-	
L5	MDI2+	
L6	MDI2-	
L7	MDI3+	
L8	MDI3-	
A	Active LED	(Yellow)
B	Speed LED	
	1000-Base-T	(Amber)
	100-Base-T	(Green)
	10-Base-T	(Dark)



1.2.13 System LED

- There are showed the LED's indicators and functional descriptions.

LED Name	Description	Color
PWR	Indicate the Power status. - LED will be on for green color when the power DC input is acceptable. - LED will be on for red color when the power DC input isn't acceptable or power fail event.	Green Red
ACT	The LED for ACT can help user's to judge BIOS finish or not and the OS can normal work or not. - LED will ON for red color when the power DC input is system active - LED will flash for red color when the BIOS start - LED will ON for green color when enter OS status. - LED will flash for green color when the storage is accessed. - LED always ON without any flash for a long time, the OS is possible crashed. - LED is off when system shutdown status	Green Red
COM TX1	When COM1 transmit data the LED will on.	Green
COM RX1	When COM1 receive data the LED will on.	Yellow
COM TX2	When COM2 transmit data the LED will on.	Green
COM RX2	When COM2 receive data the LED will on.	Yellow
COM TX3	When COM3 transmit data the LED will on.	Green
COM RX3	When COM3 receive data the LED will on.	Yellow
COM TX4	When COM4 transmit data the LED will on.	Green
COM RX4	When COM4 receive data the LED will on.	Yellow
COM TX5	When COM5 transmit data the LED will on.	Green
COM RX5	When COM5 receive data the LED will on.	Yellow
COM TX6	When COM6 transmit data the LED will on.	Green
COM RX6	When COM6 receive data the LED will on.	Yellow

1.2.14 Operation Temperature

- -40℃ ~ +70℃

1.2.15 Storage Temperature

- -45℃ ~ +85℃

1.2.16 Humidity

- 5% ~ 95% (non-condensation)

1.2.17 Weight

- 1.8kg

1.2.18 Dimensions

- 85.6mm(3.37") (W) x110mm(4.33") (D) x155mm(6.10") (H)

1.2.19 System I/O Outlets

- Two DB9 connectors support RS232/RS422/RS485 (COM1/2)
  Four isolated Terminal Block connectors support RS232/RS422/RS485 (COM3~COM6)
- One 15-pin D-Sub female connector for VGA.
- Two 10/100/1000Mbps RJ-45 with 1.5KV magnetic isolated protection.
- One isolated DIO (8-IN/8-OUT)
- One USB 2.0 connector & one USB 3.0 connector
- One DC Power Input with terminal block.
- One CompactFlash TypeII socket

1.3 Non-sparking low power equipment

The Robust Din-rail Fanless Embedded System rBOX510-6COM(ATEX&C1D2) is designed according to **EN 60079-0:2012+A11:2013 and EN 60079-15:2010 will be used in zone 2 and Class I Division 2**.

1.3.1 General information for use

Types of protection:

- rBOX510-6COM(ATEX&C1D2) is designed with type of protection "nA and nC".
- DEMKO 15 ATEX 1516X marking:  II 3 G Ex nA nC IIC T4 Gc and  Class I Div. 2 Groups ABCD T4
- Ambient temperature:-40℃~+70℃
- The devices are for use in an area of not more than pollution degree 2 in accordance with EN/IEC 60664-1.
- All of fuses shall be soldered in place,and the fuses are non-interchangeable.
- The devices are to be installed in an ATEX Certified IP54 enclosure and accessible only by the use of a tool.

  (WARNING - EXPLOSION HAZARD – Do not disconnect equipment unless power has been removed or the area is known to be non-hazardous.)
- This equipment is suitable for use in Class I, Division 2, Groups A, B, C, and D or non-hazardous locations only.

  (WARNING - EXPLOSION HAZARD – Substitution of any components may impair suitability for Class I, Division 2.)
- Provision shall be made to prevent the rated voltage being exceeded by the transient disturbances of more than 140% of the peak rated voltage.
- After the Robust Din-rail Fanless Embedded System is mounted and fixed, the customer will make the whole system grounded, and the ground wire needs to meet the requirement of EN60079-0, besides, the cross-section area of the ground wire is at least 4mm².

The I/O ports of non-sparking equipment will be possible connected instruments or equipments as below examples:

- Two DB9 connectors support RS232/RS422/RS485 (COM1/2)
  Four isolated Terminal Block connectors support RS232/RS422/RS485 (COM3~COM6)
  It will be possibled linked the temperature sensor, wet sensor, meters.

- Two Isolated 10/100/1000Mbps Ethernet
  It will be possible connected the wired network (HiNet/ NiLink/ Internet)

- One Isolated DIO (8-IN/8-OUT) port with Magnetic Isolation Protectio
  It will be possible linked digital electronic power lemter.

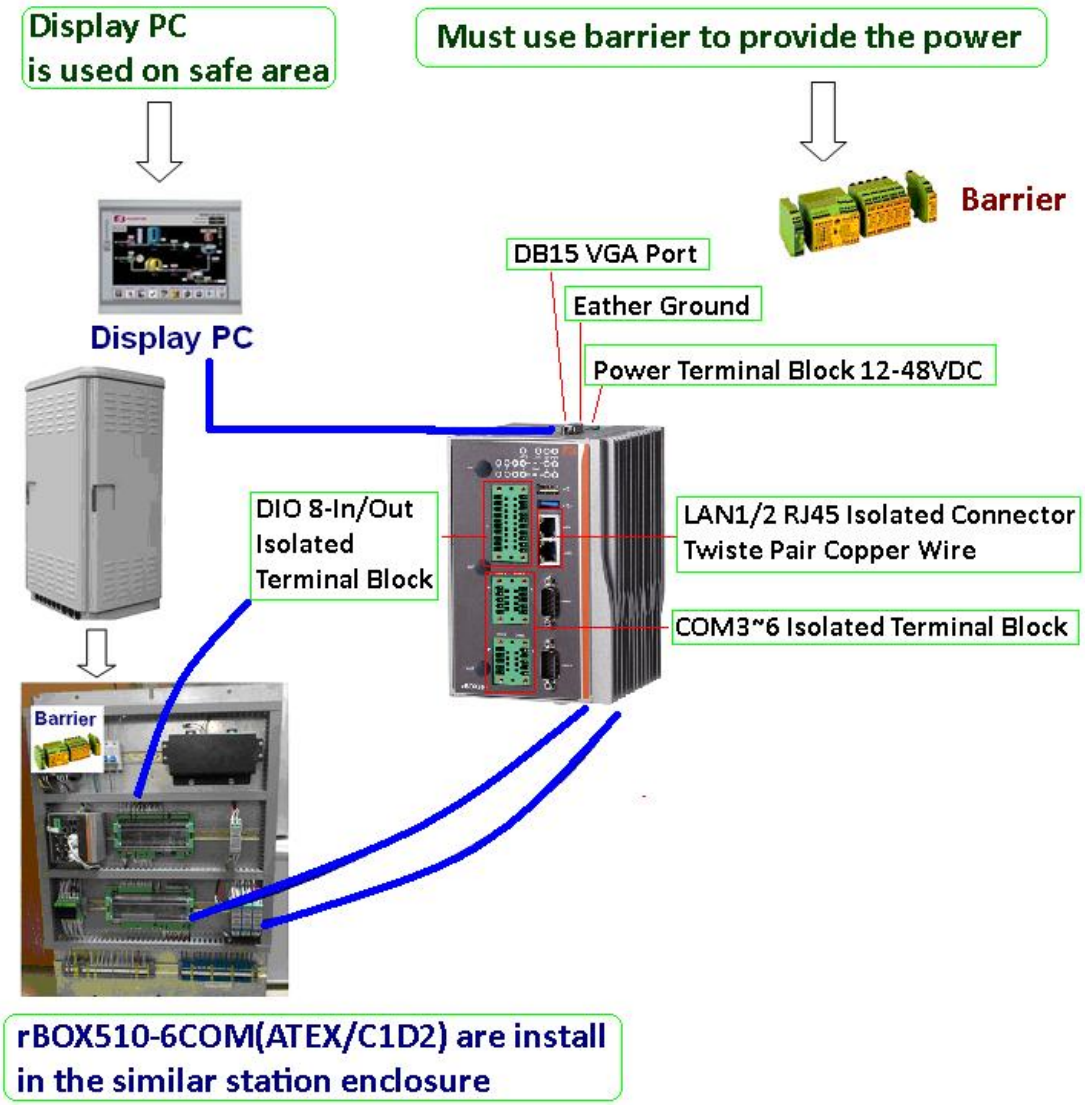
- Two USB
  It is always plugged-in the USB housing cover (pls refer below picture), excepting equipment maintenance and repair situation. 
  It is used for maintenance and repair only, ex: accesse data by plugging in USB flash, or check data & remove wrong data by using USB type of keyboard/mouse.

- VGA
  It will be possible linked the monitoring and management equipment.

WARNING – EXPOSURE TO SOME CHEMICALS MAY DEGRADE THE SEALING PROPERTIES OF MATERIALS USED IN THE FOLLOWING DEVICES: Sealed Relay Device.

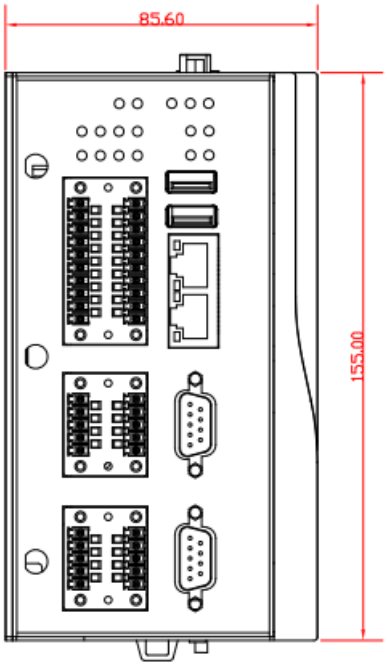
1.3.2 Field Installation

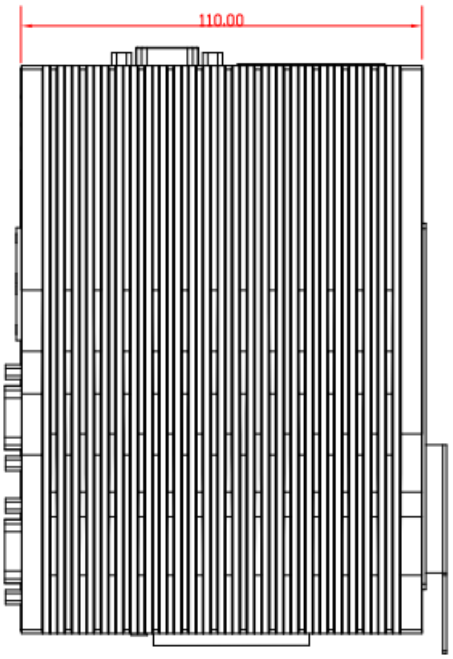
- Input Terminal Block (CN3) suitable for 12-28 AWG (0.0804-3.31 mm²) wire size, torque value 4.5 lb-in (0.5085 Nm).
- Output Terminal Block (CN5, CN6) suitable for 14-28 AWG (0.0804-2.1 mm²) wire size, torque value 1.7 lb-in (0.1921 Nm) .
- Output Terminal Block (CN7) suitable for 14-28 AWG (0.0804-2.1 mm²) wire size, torque value 1.7 lb-in (0.1921 Nm) .
- The equipment shall be installed in an enclosure that provides a degree of protection not less than IP 54 in accordance with EN 60079-15 and accessible only by the use of a tool.



1.4 Dimensions

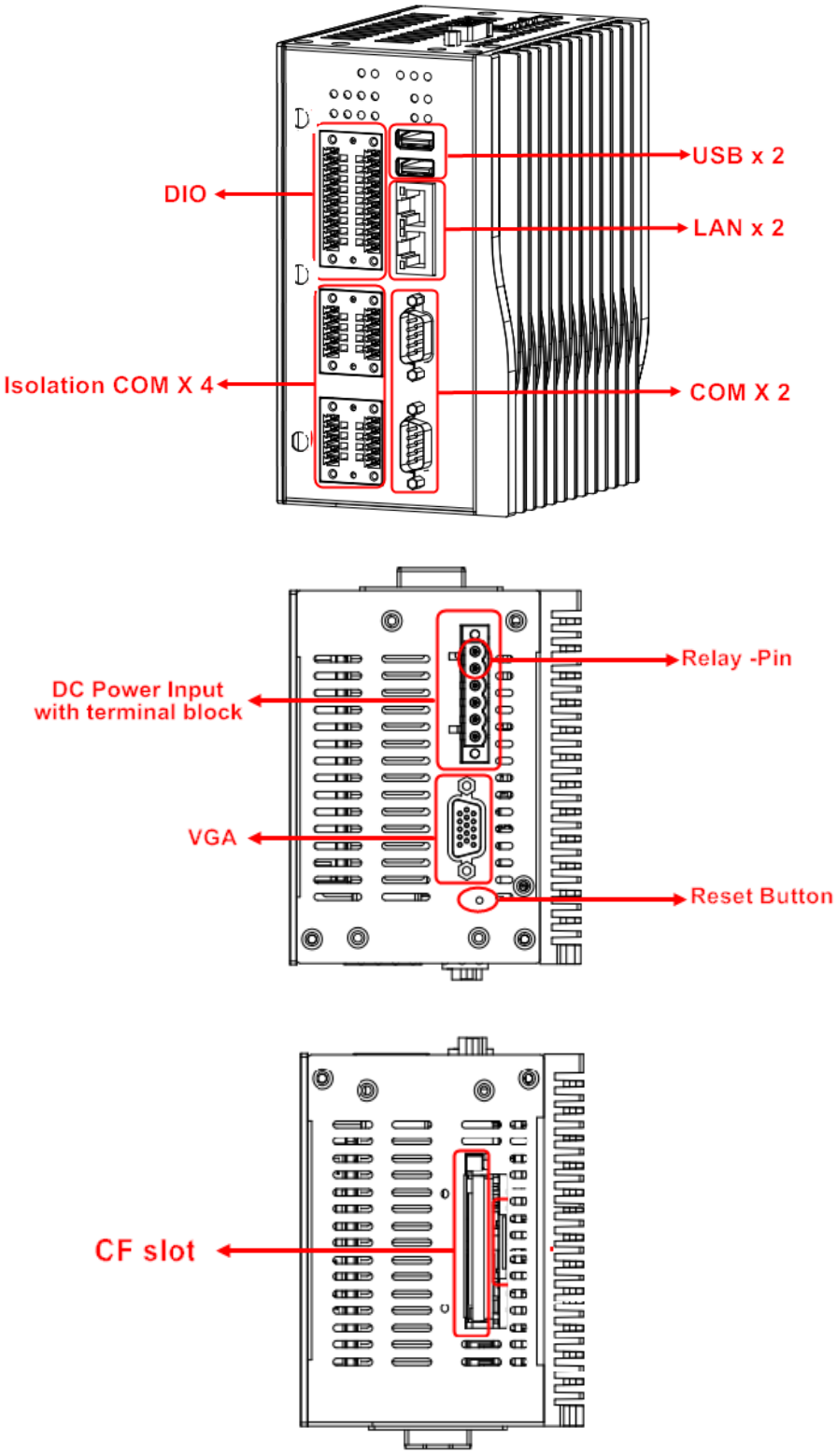
The following diagrams show you dimensions and outlines of the rBOX510-6COM(ATEX&C1D2).





1.5 I/O Outlets

The following figures show you I/O outlets on front view and top view of the rBOX510-6COM(ATEX&C1D2).



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CHAPTER 2
HARDWARE INSTALLATION

The rBOX510-6COM(ATEX&C1D2) is convenient for your various hardware configurations. The chapter 2 will show you how to install the hardware. It includes:

2.1 Installing Din-rail Mounting

The rBOX provides Din-rail Mount that customers can install as below:

Step 1 Prepare Din-rail Mount assembling components (screws and bracket) ready.

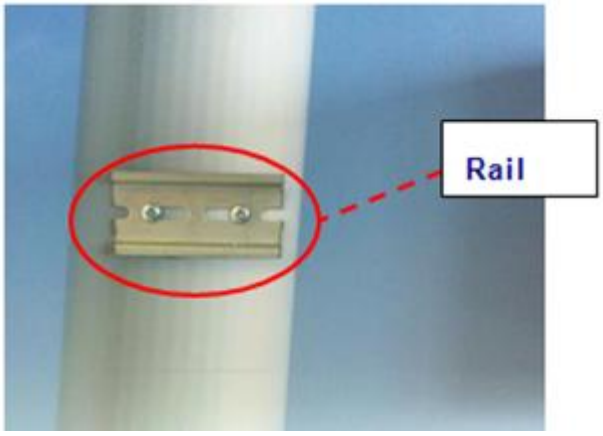
Step 2 Assembly the bracket to the system, and fasten screws tight.

Note: Please notice the Din-rail holes with Wall-mounting holes while assembly the bracket to system.

Setting up rBOX series by Din-rail mounting

The rBOX set up by Din-rail mounting as below:

Step 1 Fixing the rail firstly.



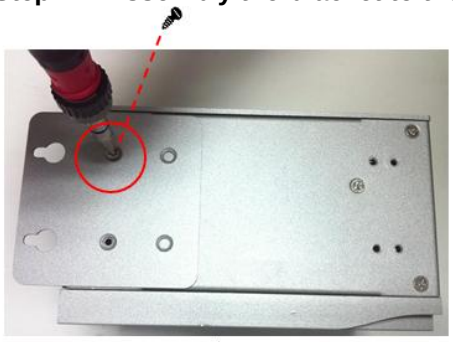
Step 2 Set up the rBOX on the rail by Din-rail mounting

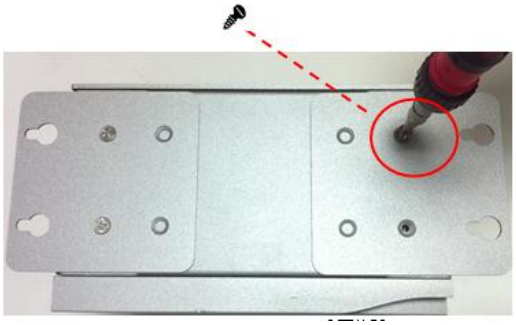
2.2 Installing Wall Mounting (optional)

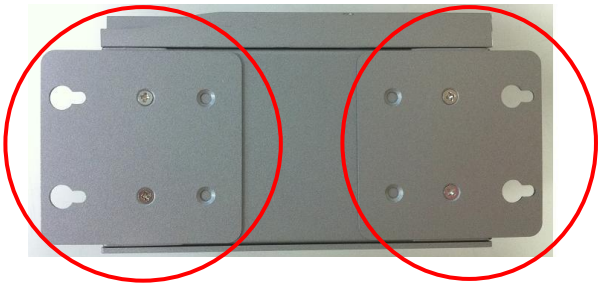
The rBOX provides Wall Mounting that customers can install as below:

Step 1 Prepare Wall Mount assembling components (screws and bracket) ready.

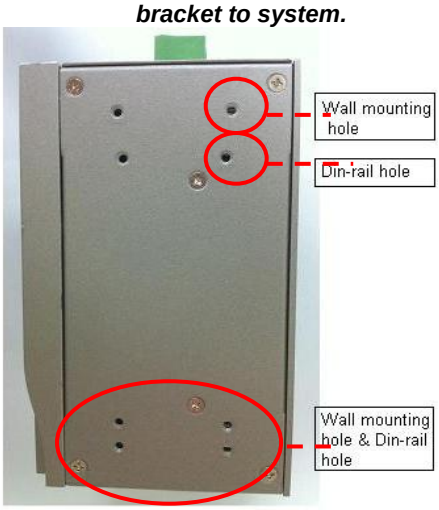
Step 2 Assembly the bracket to the system, and fasten screws tight.







Note: ***Please notice the Din-rail holes with Wall-mounting holes while assembly the bracket to system.***



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CHAPTER 3
AMI UEFI BIOS UTILITY

The AMI UEFI BIOS provides users with a built-in Setup program to modify basic system configuration. All configured parameters are stored in a flash-backed-up to save the Setup information whenever the power is turned off.

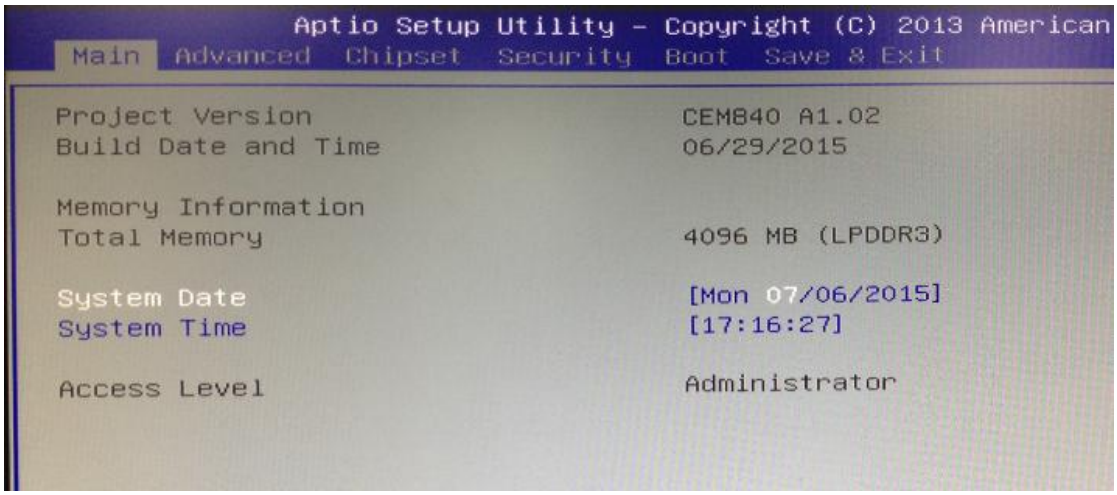
3.1 Entering Setup

To enter the setup screens, follow the steps below:

1. Turn on the computer and press the <Del> key immediately.
2. After you press the <Del> key, the main BIOS setup menu displays. You can access the other setup screens from the main BIOS setup menu, such as the Advanced and Chipset menus.

3.2 The Main Menu

Once you enter the AMI BIOS Aptio Setup Utility, the Main Menu appears on the screen. In the Main Menu, there are several Setup functions and a couple of Exit options for your selection. Use Select Screen Keys (or Move Keys) to select the Setup Page you intend to configure then press <Enter> to accept or enter its sub-menu.



System Date
The date format is <day> <month> <date> <year>.

System Time
This item shows current time of your system with the format <hour> <minute> <second>. The time is calculated based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

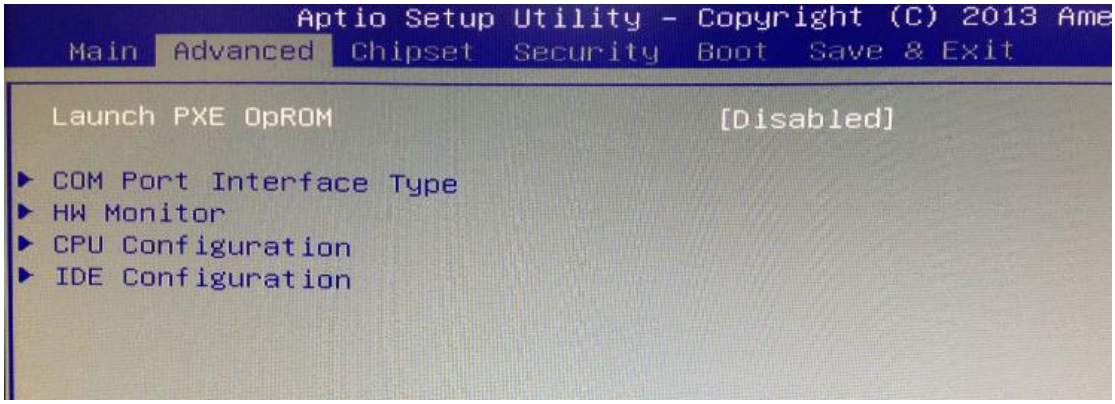
3.3 Advanced Features

This Advanced section allows users to configure and improve your system, to set up some system features according to your preference. You can select any of the items in the left frame of the screen to go to the sub menus:

- **Launch PXE opROM**

The default setting boot from onboard LAN PxE Rom is [Disabled]

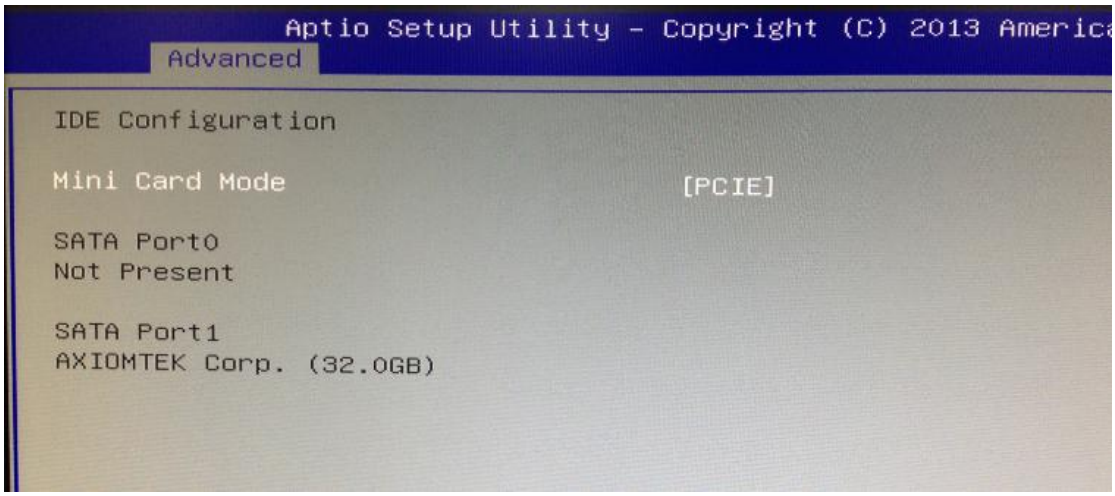
(Please refer below graphics.)

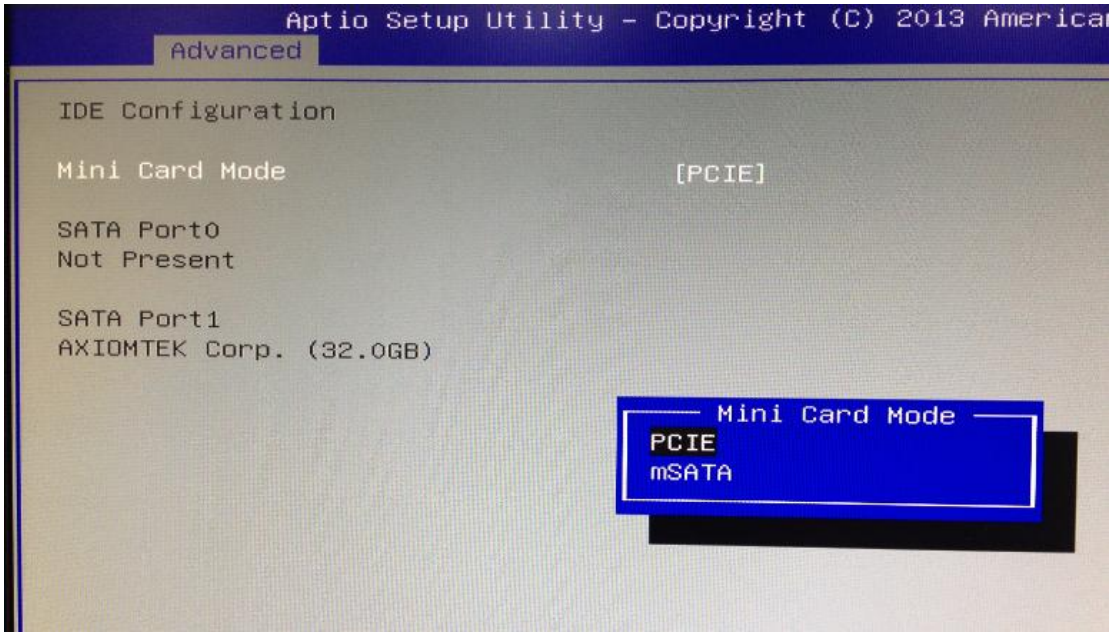


- **PCIE/mSATA Mini Card configuration**

The default setting for mini card is PCIE.

(Please refer below graphics.)



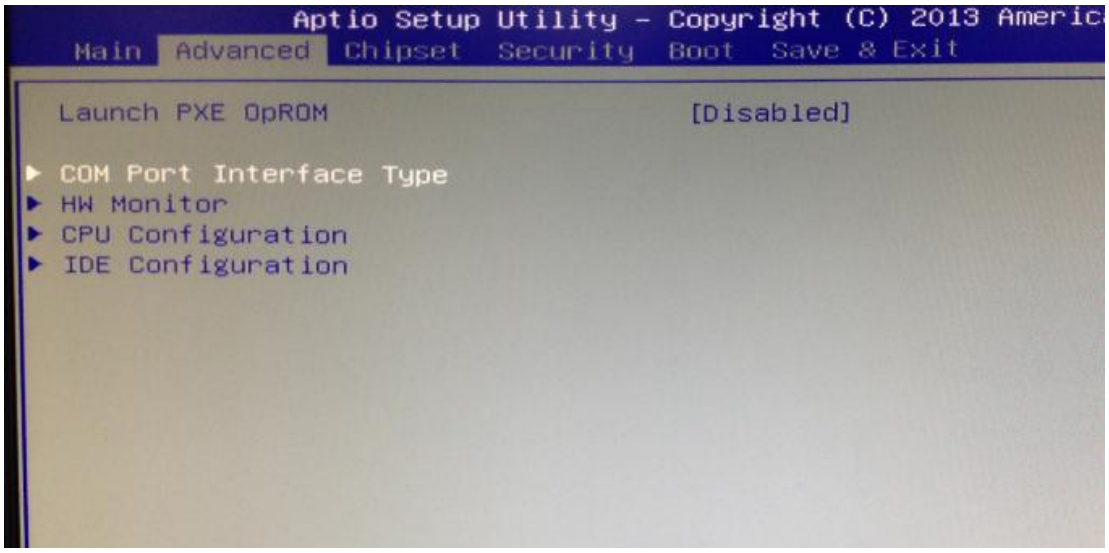


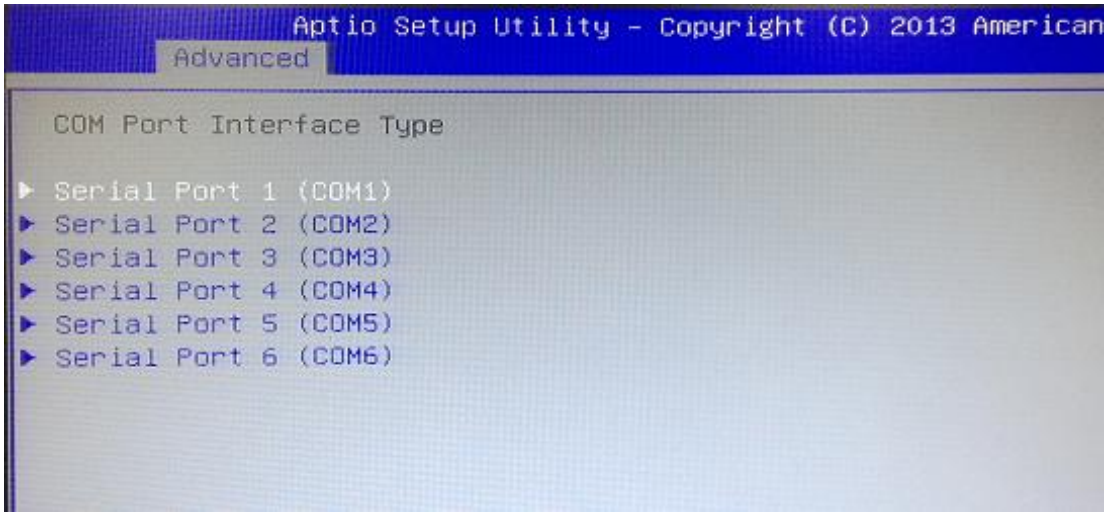
Note: SSD and mSATA function can be either one, it can be select by BIOS menu. mSATA and wireless use the same slot, and only one of them can be selected.

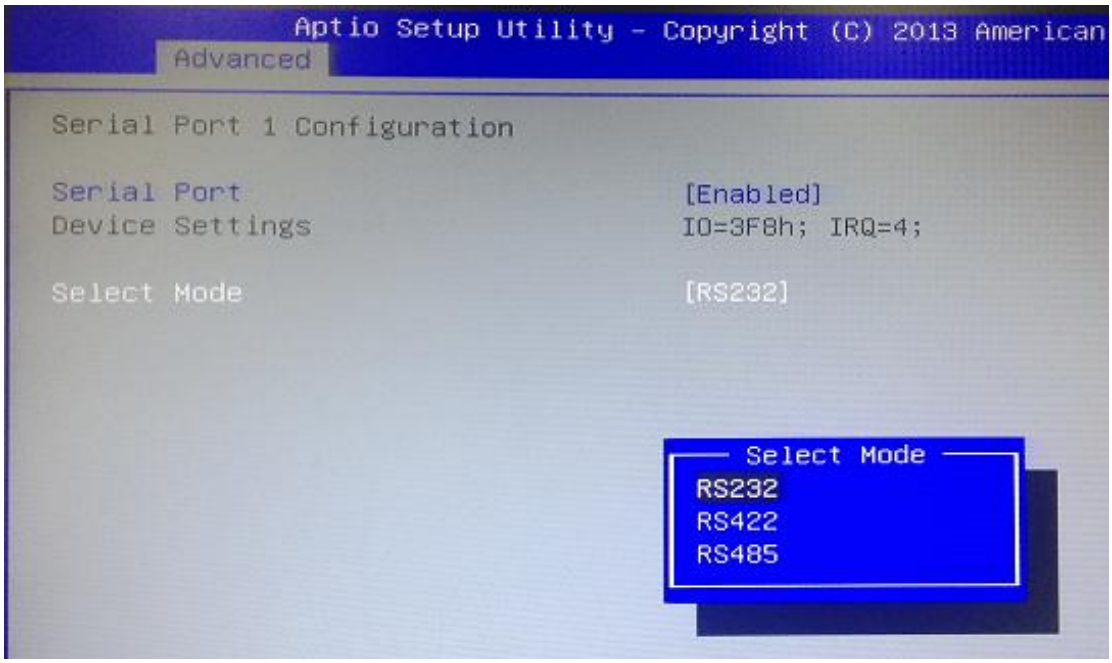
- **COM Port Interface Type**

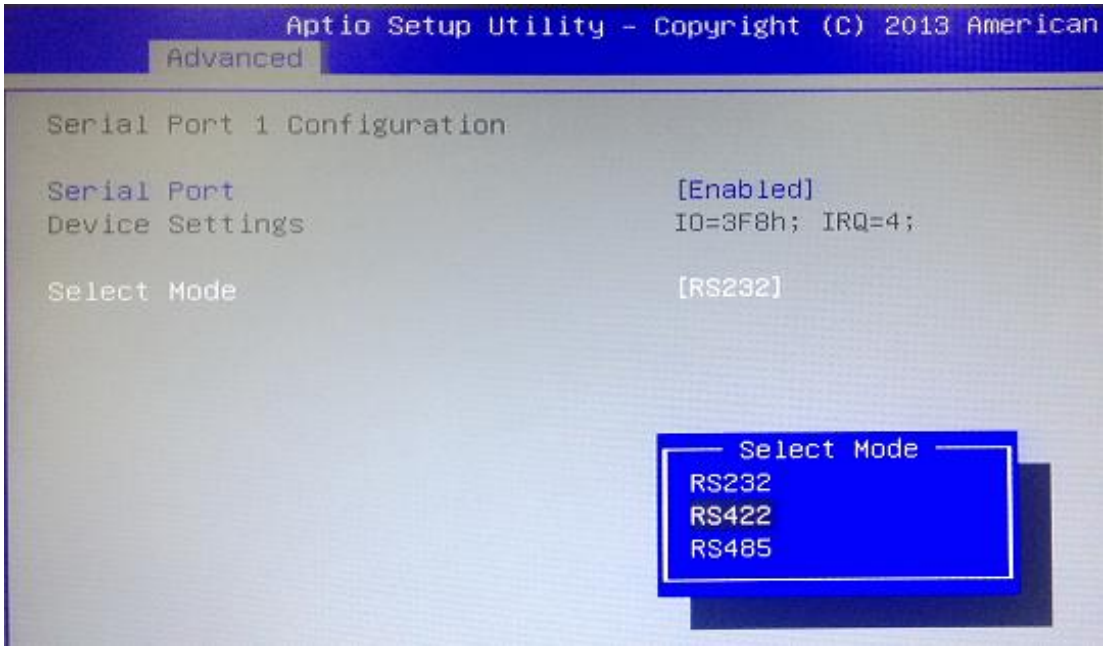
The default setting for all Serial Ports are RS232.
You can change the setting by selecting the value you want in each COM Port Type.

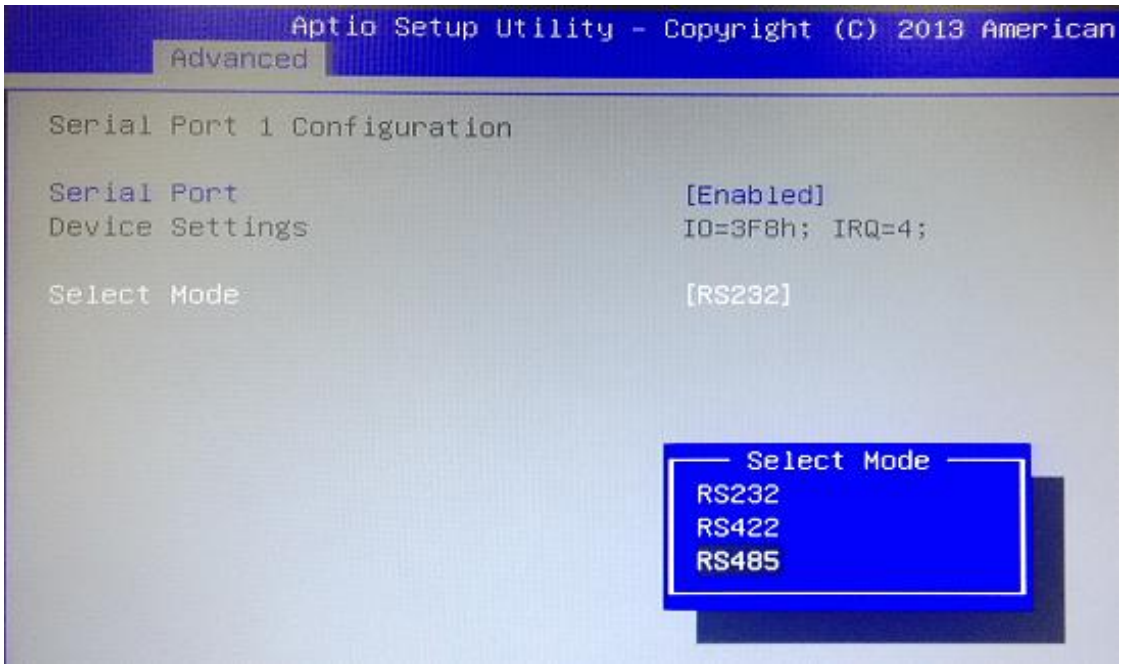
(Please refer below graphics.)





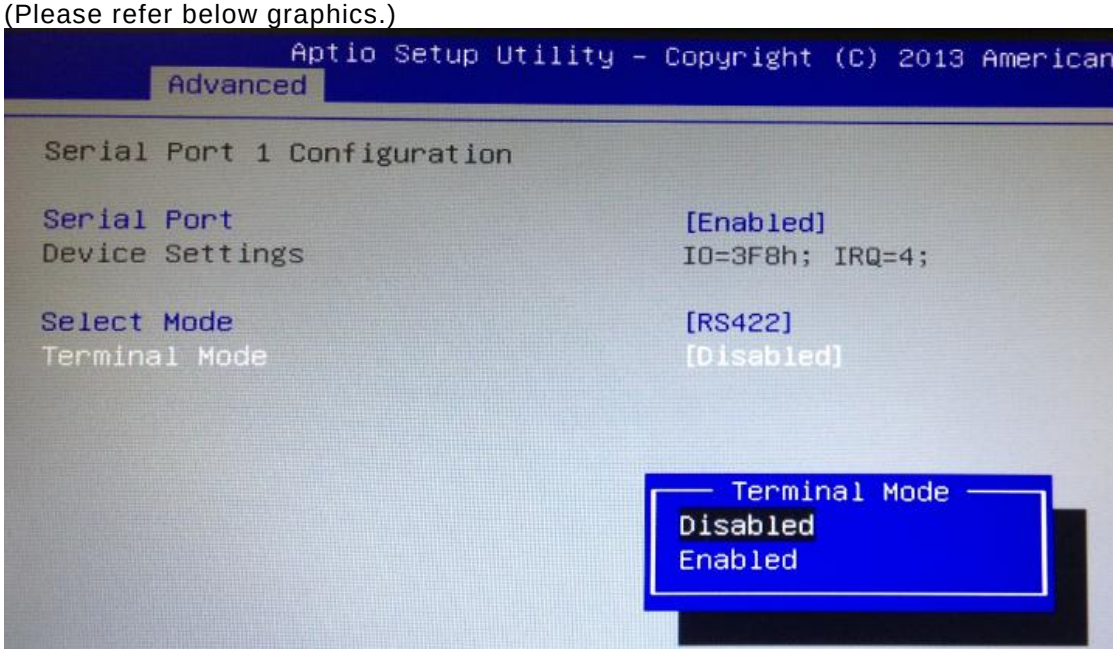

Aptio Setup Utility – Copyright (C) 2013 American
Advanced
Serial Port 1 Configuration
Serial Port [Enabled]
Device Settings IO=3F8h; IRQ=4;
Select Mode [RS232]
Select Mode
RS232
RS422
RS485

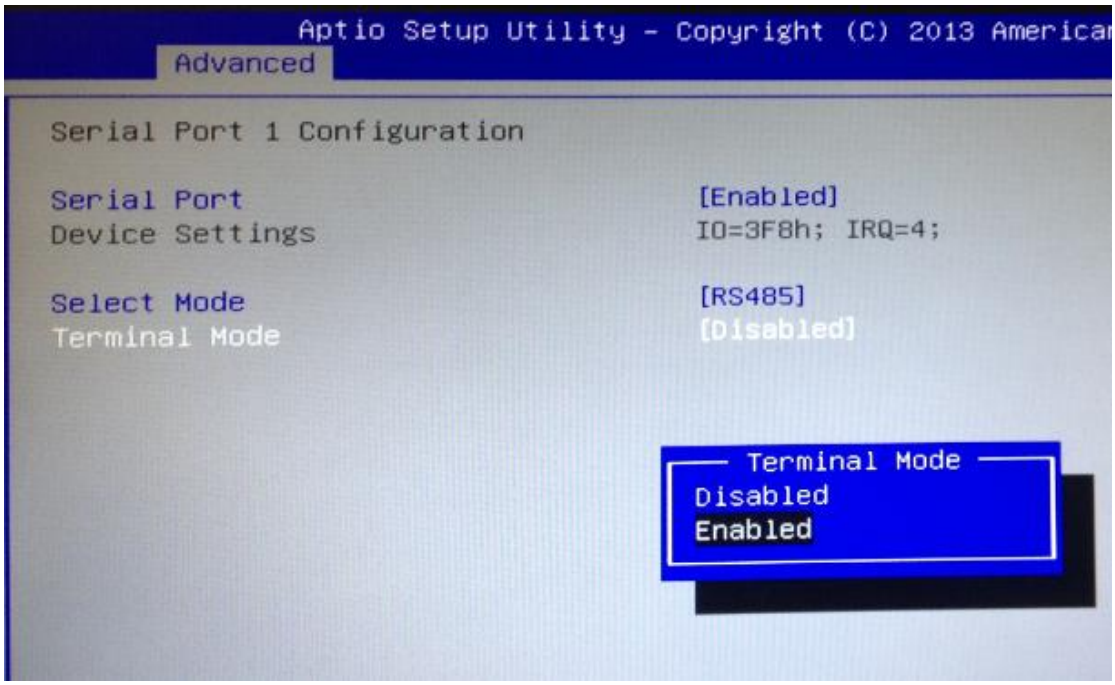

Aptio Setup Utility – Copyright (C) 2013 American
Advanced
Serial Port 1 Configuration
Serial Port [Enabled]
Device Settings IO=3F8h; IRQ=4;
Select Mode [RS232]
Select Mode
RS232
RS422
RS485



Supports internal 120 ohms terminator in RS422 & RS485 mode.

(Please refer below graphics.)

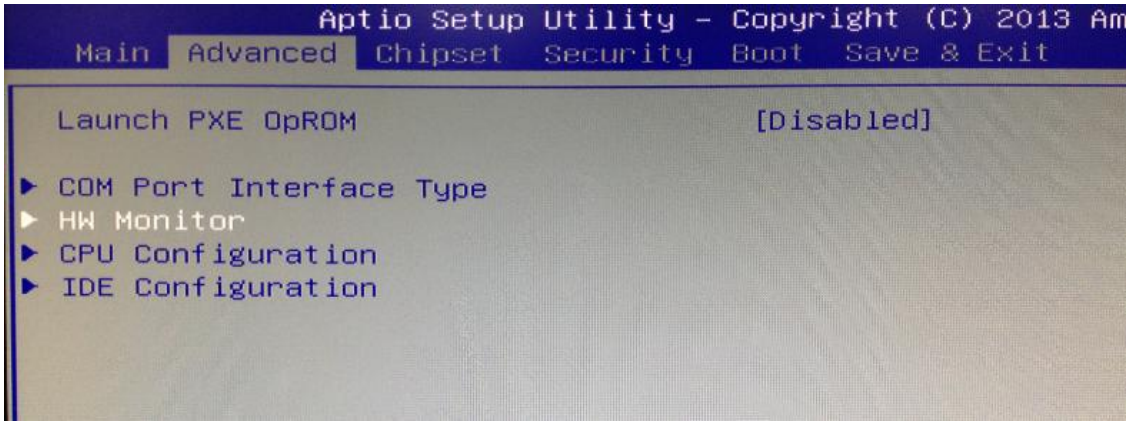


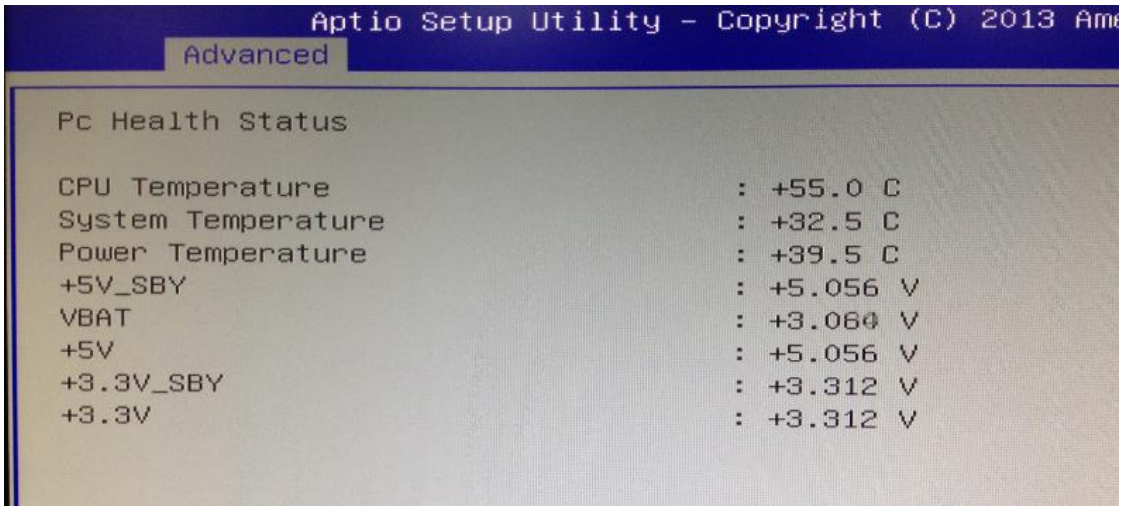


- **H/W Monitor**

Scroll to this item and press <Enter> to view the monitor hardware status.

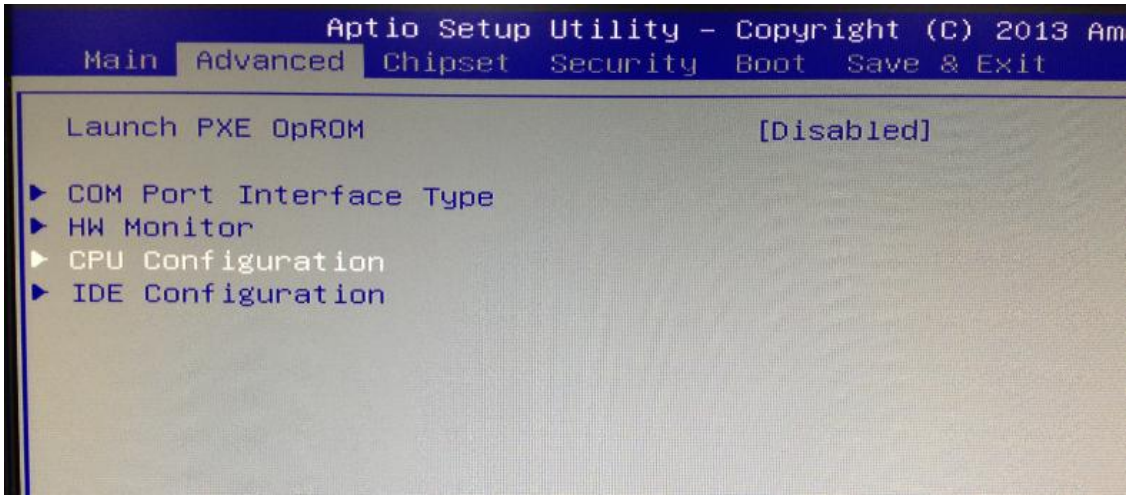
(Please refer below graphics.)

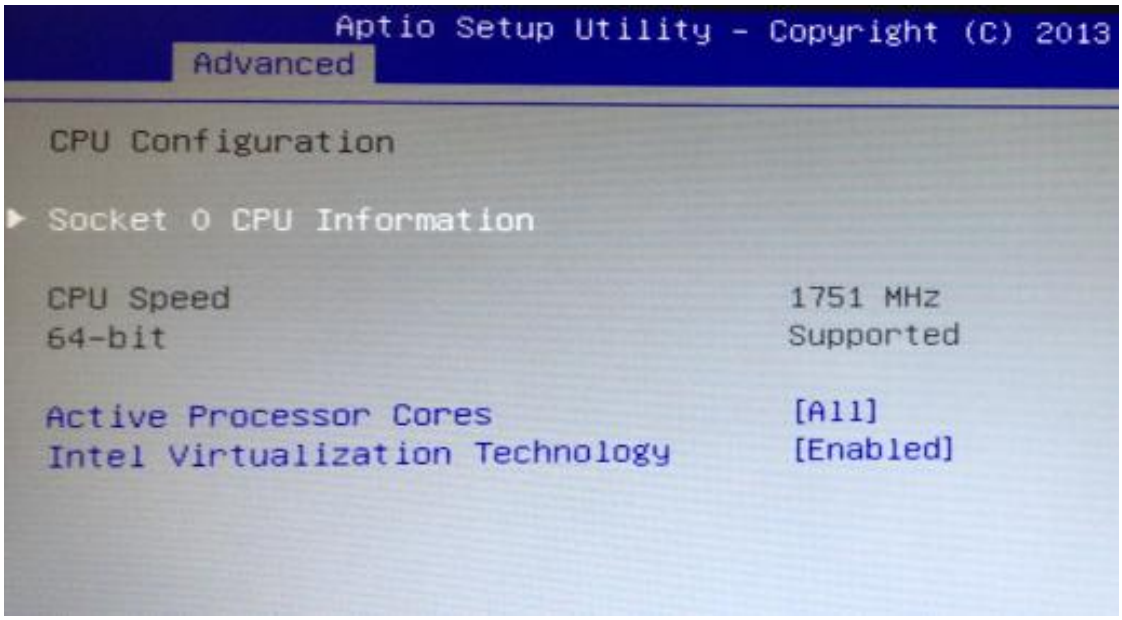


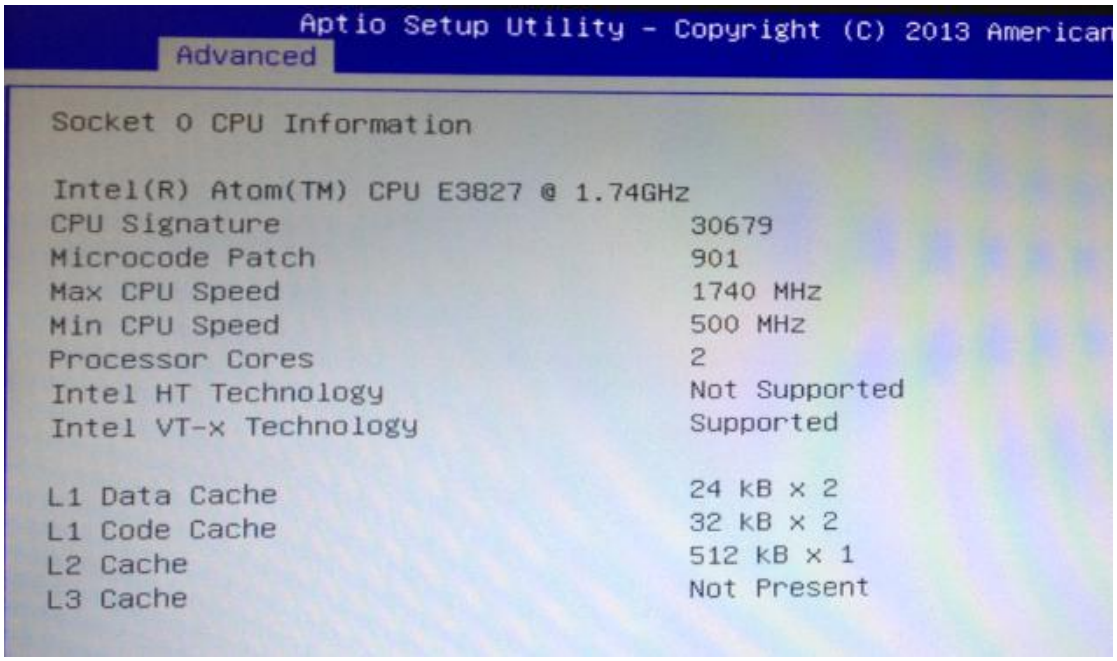


- **CPU Configuration**

Scroll to this item and press <Enter> to view the CPU Configuration informations. (Please refer below graphics.)



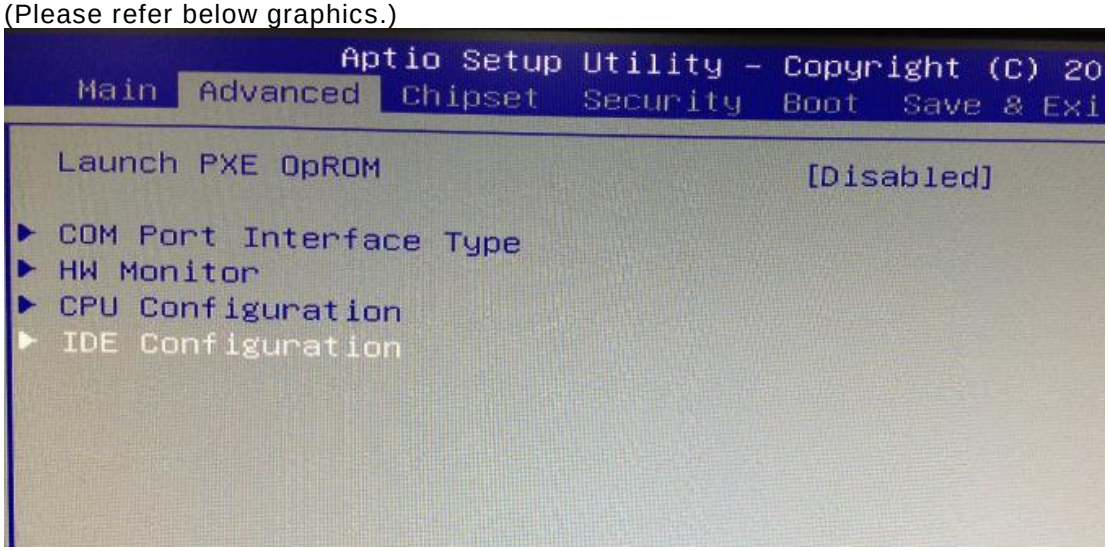

Aptio Setup Utility – Copyright (C) 2013
Advanced
CPU Configuration
Socket 0 CPU Information
CPU Speed 1751 MHz
64-bit Supported
Active Processor Cores [All]
Intel Virtualization Technology [Enabled]

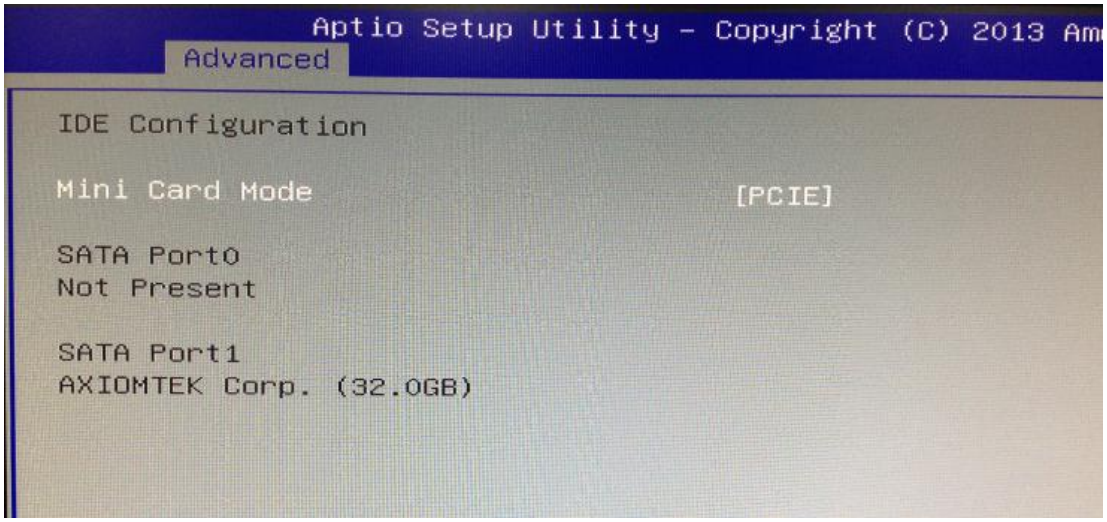

Aptio Setup Utility – Copyright (C) 2013 American
Advanced
Socket 0 CPU Information
Intel(R) Atom(TM) CPU E3827 @ 1.74GHz
CPU Signature 30679
Microcode Patch 901
Max CPU Speed 1740 MHz
Min CPU Speed 500 MHz
Processor Cores 2
Intel HT Technology Not Supported
Intel VT-x Technology Supported
L1 Data Cache 24 kB x 2
L1 Code Cache 32 kB x 2
L2 Cache 512 kB x 1
L3 Cache Not Present

- **IDE Configuration**

Scroll to this item and press <Enter> to view the IDE Configuration informations.

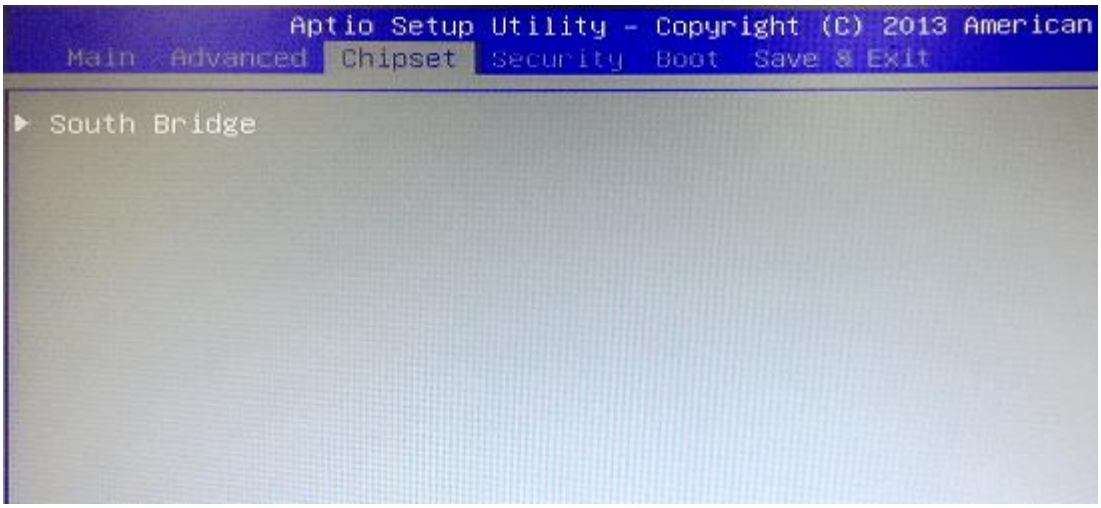
(Please refer below graphics.)





3.4 Chipset Feature

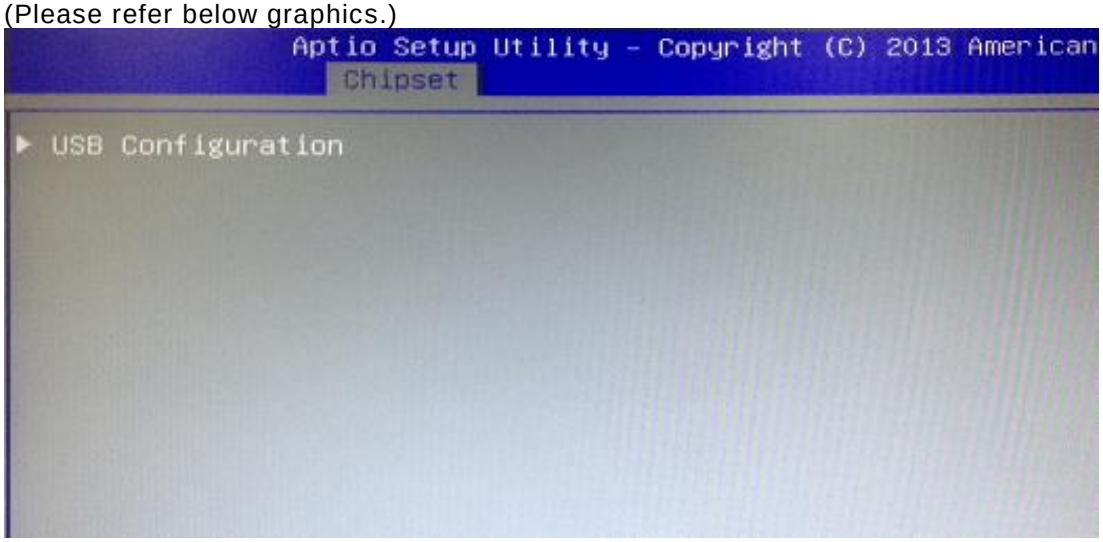
This section contains completely optimized chipset's features in the system

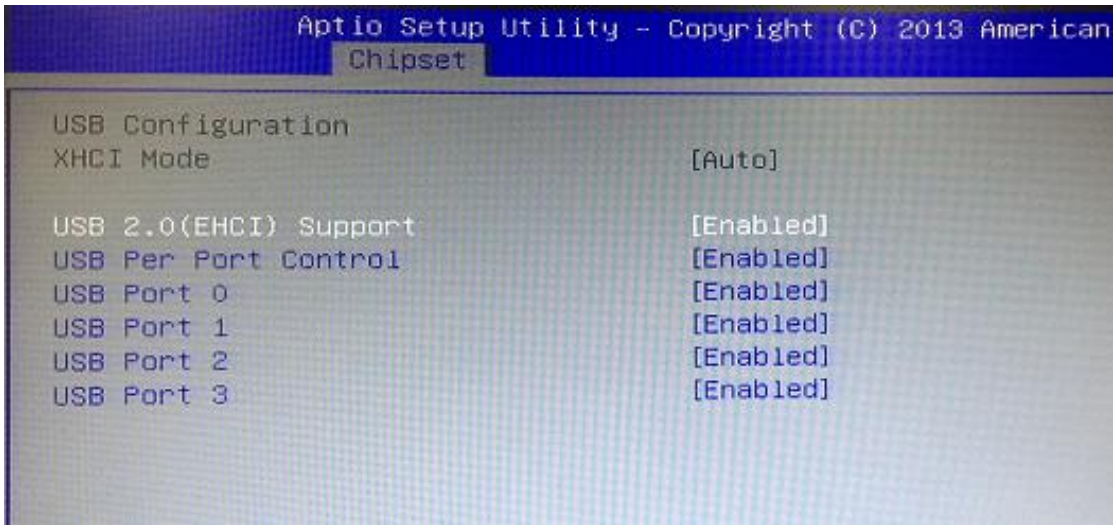


- **USB Configuration**

Scroll to this item and press <Enter> to view the USB Configuration informations.

(Please refer below graphics.)

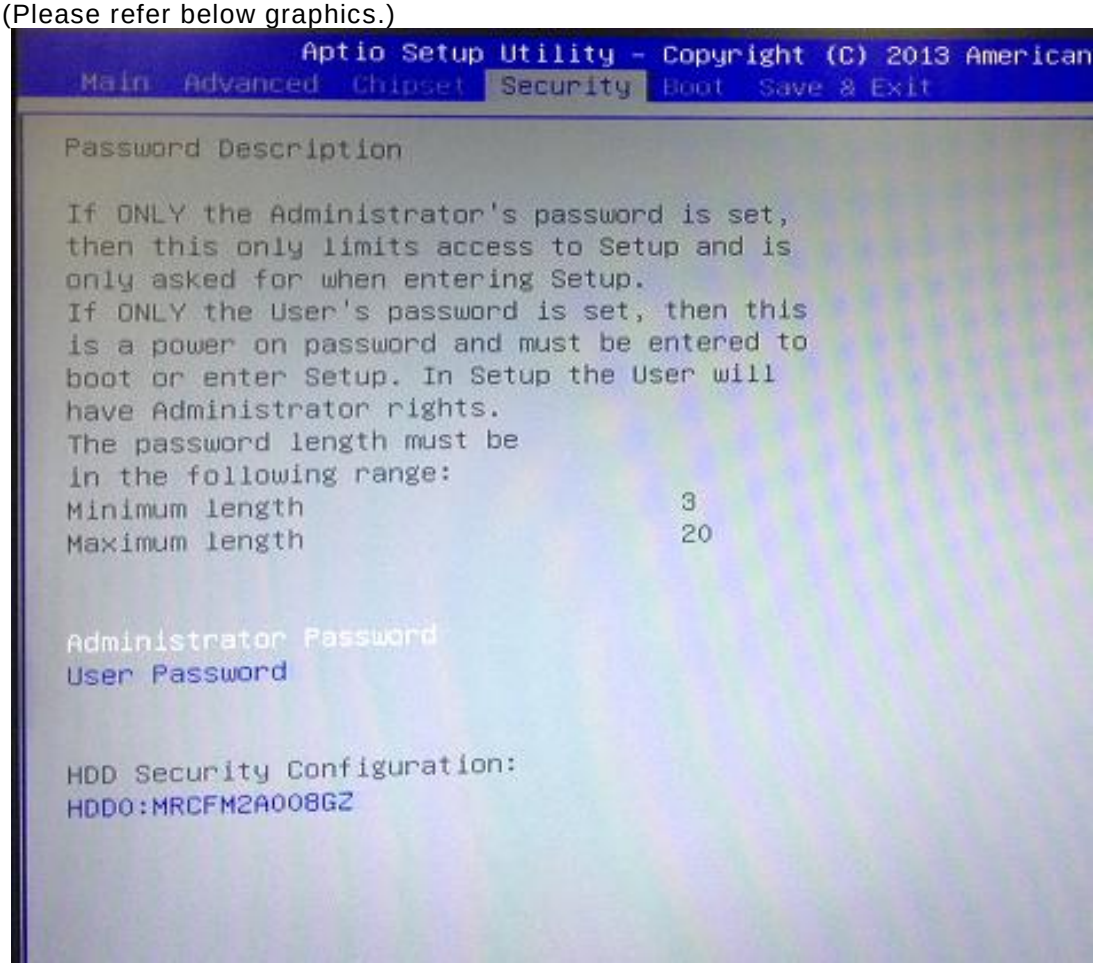


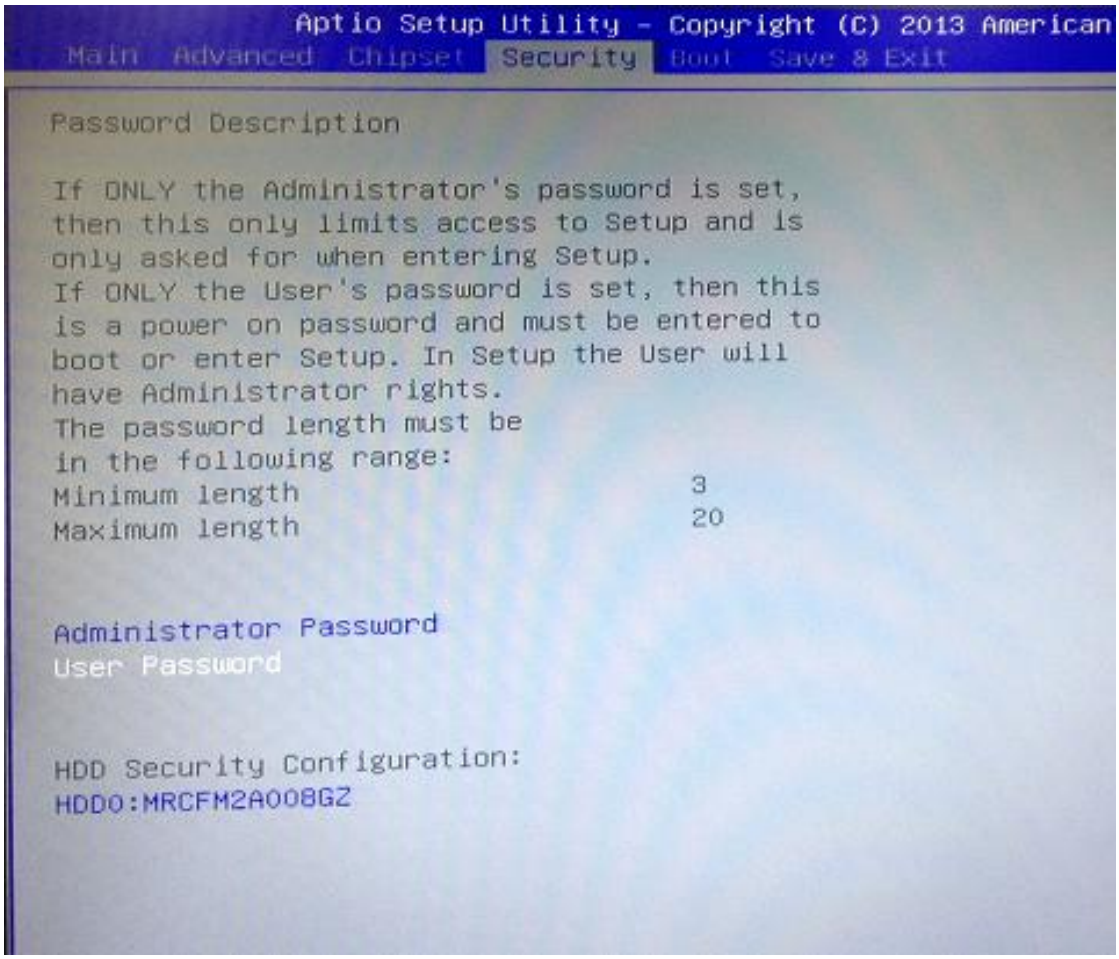


3.5 Security

The default setting for Administrator Password is "Not setting passwords".
The Security menu allows users to change the security settings for the system.
You can set the password for both Administrator Password and User Password.

(Please refer below graphics.)



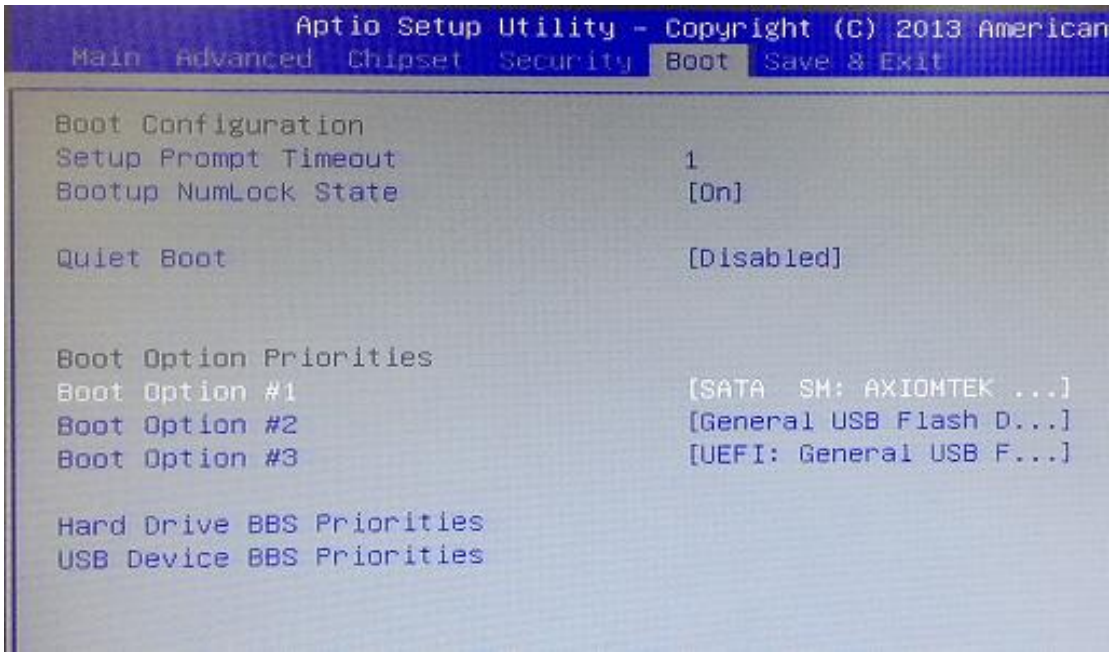


Note: The BIOS default has no password, when user created the password, please remember the password number, if users forget password the RMA is the only solution.

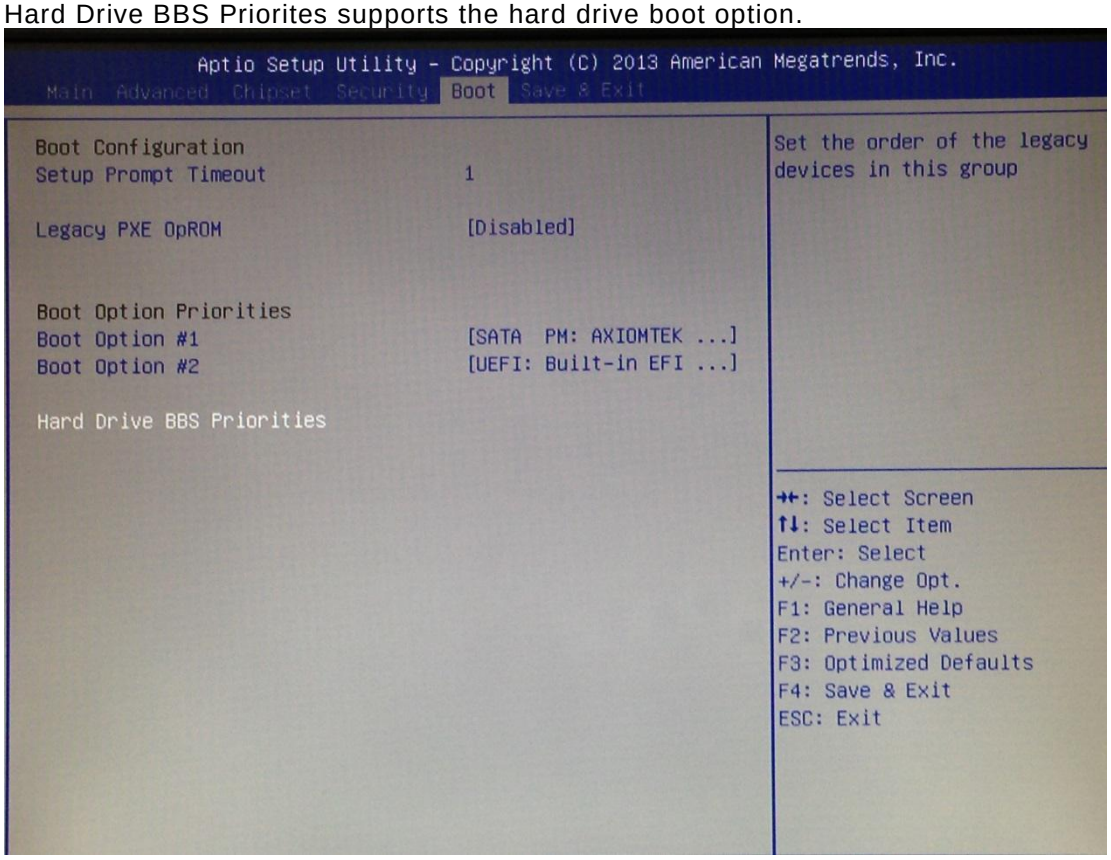
3.6 Boot Type

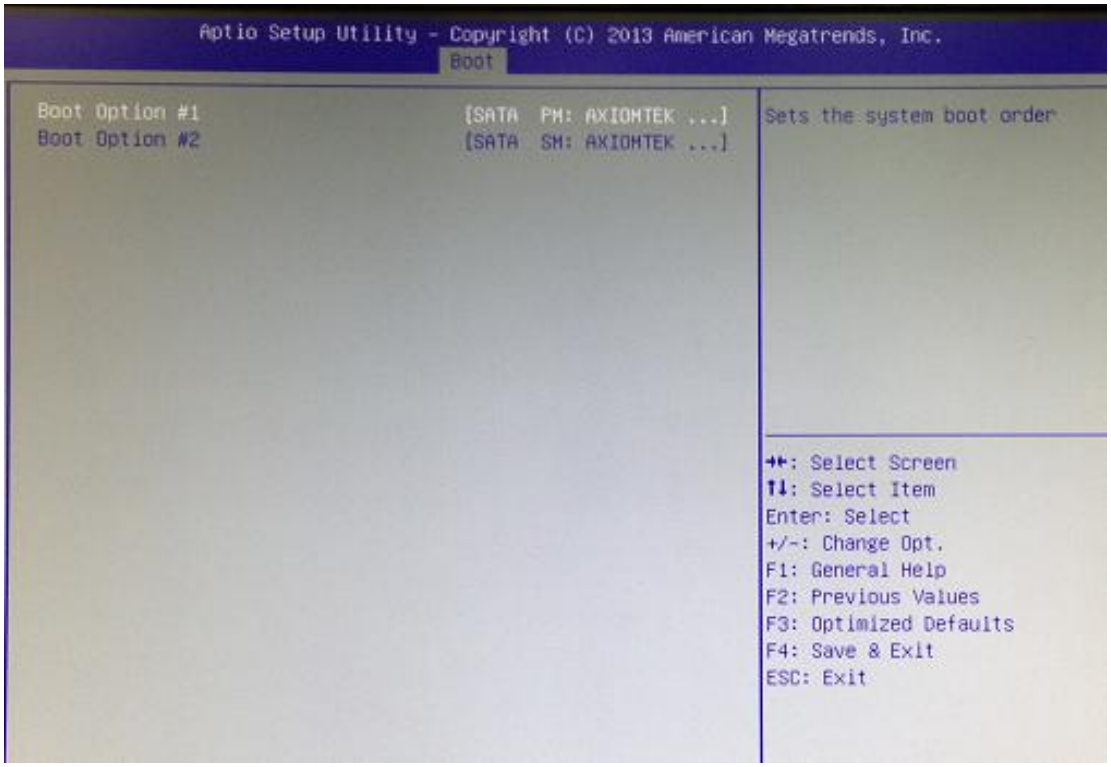
The Boot Option Priorities can select by Boot Option #1, #2…

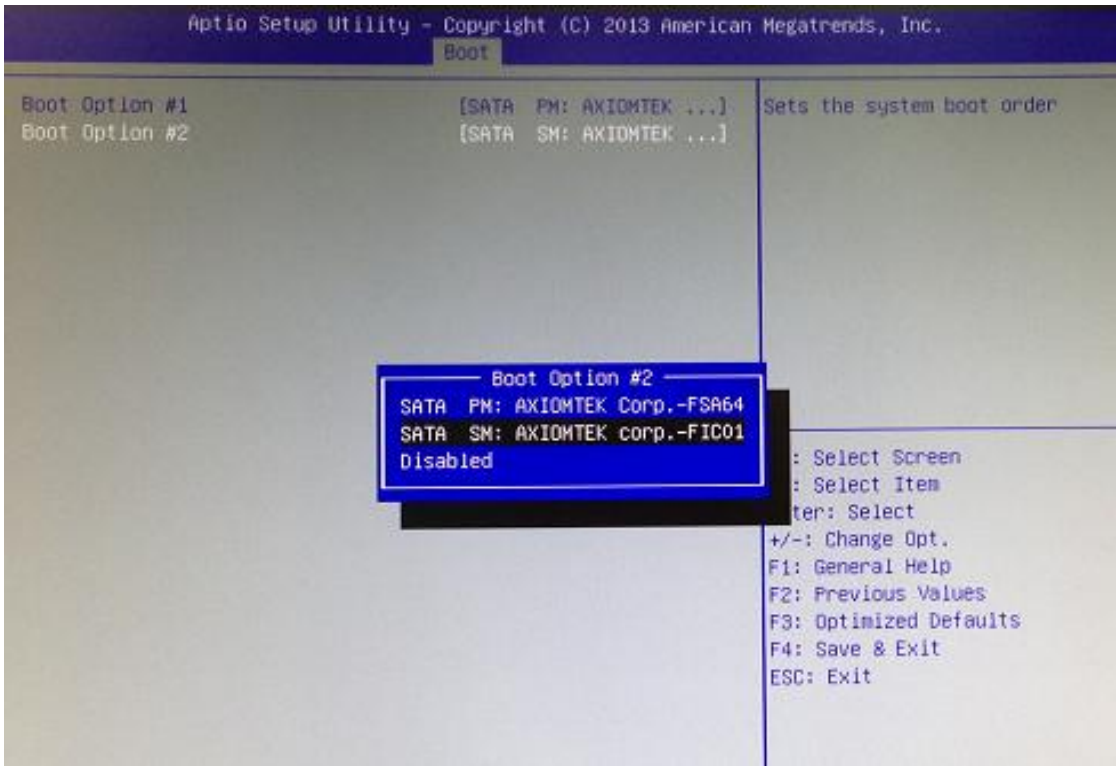
(Please refer below graphics.)



Hard Drive BBS Priorites supports the hard drive boot option.



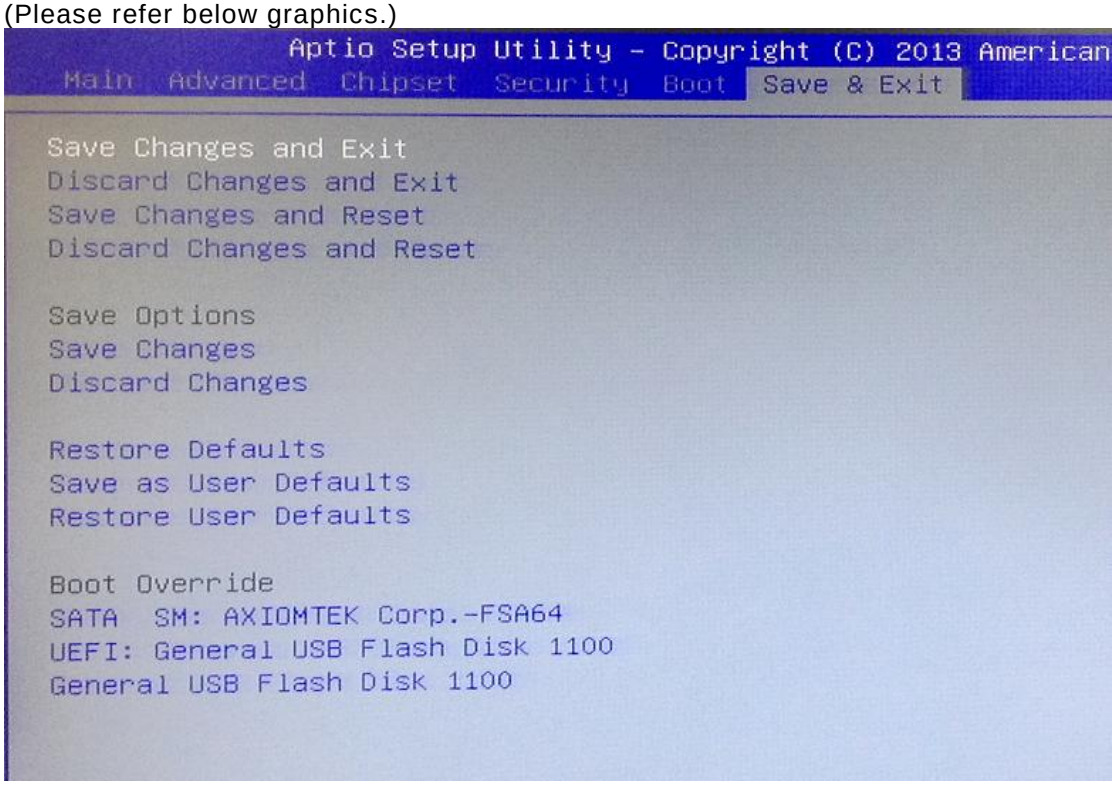


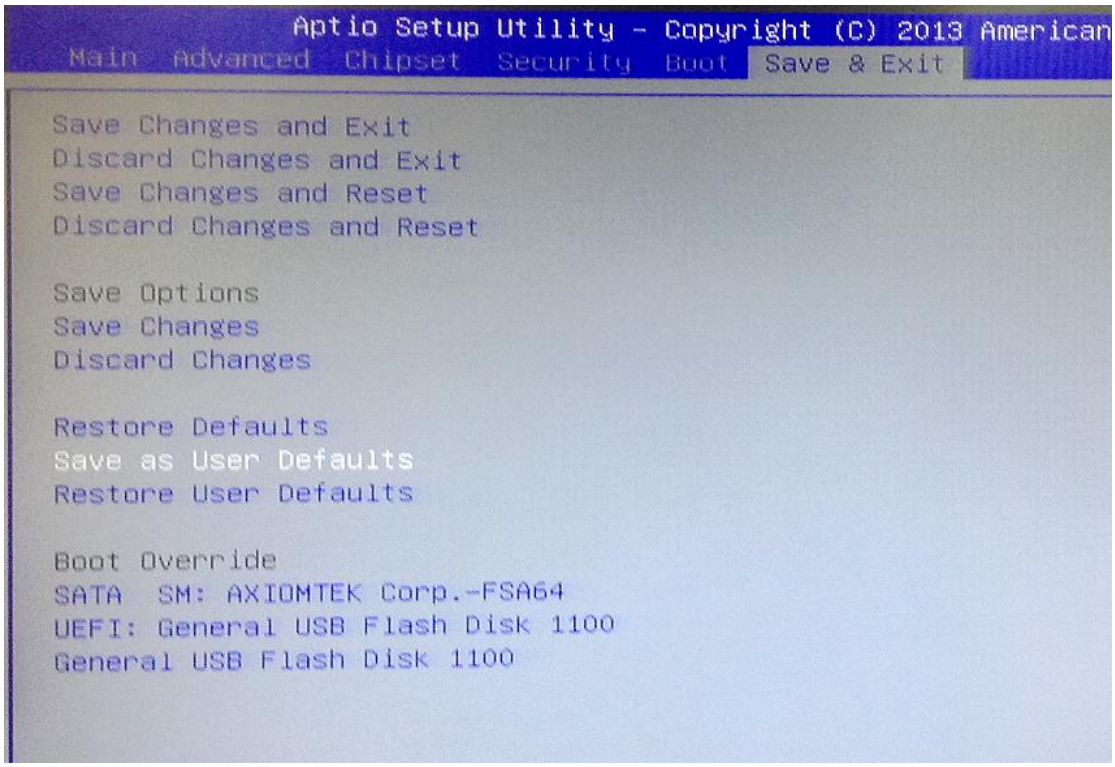

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
Boot
Boot Option #1 [SATA PM: AXIOMTEK ...]
Boot Option #2 [SATA SM: AXIOMTEK ...]
Sets the system boot order
Boot Option #2
SATA PM: AXIOMTEK Corp.-FSA64
SATA SM: AXIOMTEK corp.-FIC01
Disabled
: Select Screen
: Select Item
ter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

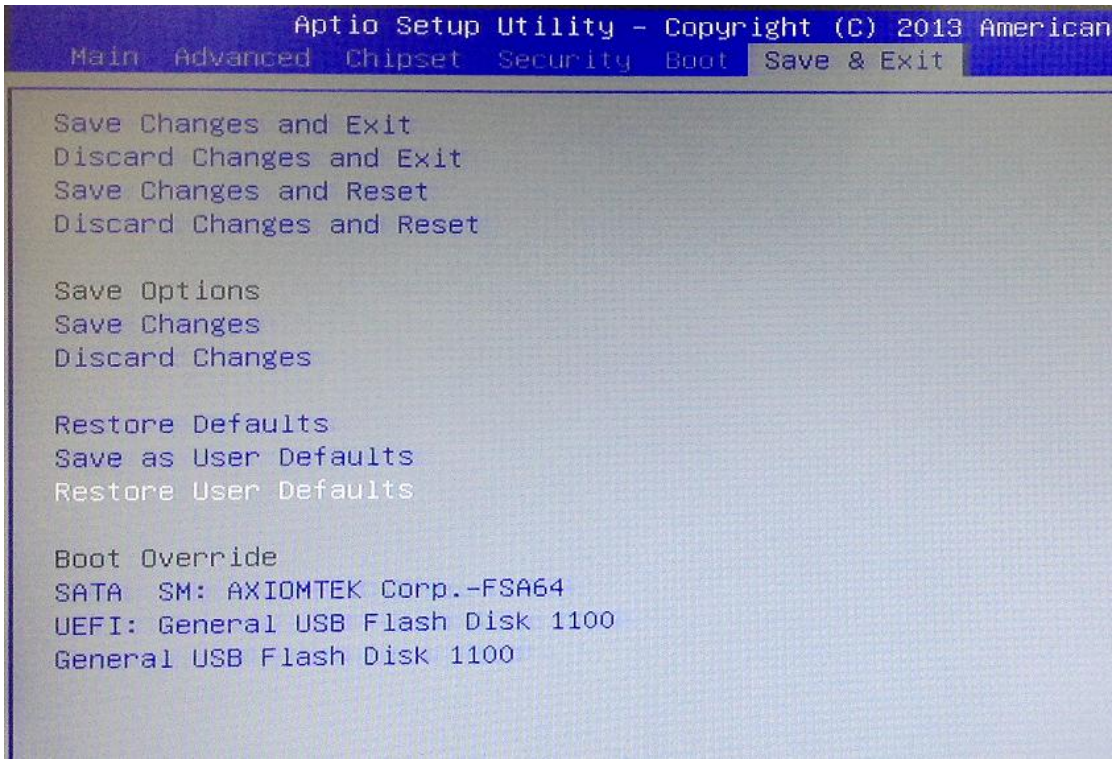
3.7 Save & Exit

This section allows you to determine whether or not to accept your modifications. Type "Y" to quit the setup utility and save all changes. Type "N" to bring you back to the Previous Setup utility.

(Please refer below graphics.)




Aptio Setup Utility – Copyright (C) 2013 American
Main Advanced Chipset Security Boot Save & Exit
Save Changes and Exit
Discard Changes and Exit
Save Changes and Reset
Discard Changes and Reset
Save Options
Save Changes
Discard Changes
Restore Defaults
Save as User Defaults
Restore User Defaults
Boot Override
SATA SM: AXIOMTEK Corp.-FSA64
UEFI: General USB Flash Disk 1100
General USB Flash Disk 1100


Aptio Setup Utility – Copyright (C) 2013 American
Main Advanced Chipset Security Boot Save & Exit
Save Changes and Exit
Discard Changes and Exit
Save Changes and Reset
Discard Changes and Reset
Save Options
Save Changes
Discard Changes
Restore Defaults
Save as User Defaults
Restore User Defaults
Boot Override
SATA SM: AXIOMTEK Corp.-FSA64
UEFI: General USB Flash Disk 1100
General USB Flash Disk 1100

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APPENDIX A
WATCHDOG TIMER

About Watchdog Timer

After the system stops working for a while, it can be auto-reset by the watchdog timer. The integrated watchdog timer can be set up in the system reset mode by program.

How to Use Watchdog Timer

The following example enables configuration using debug tool.

Enable WDT

↓

Enable configuration:

O 4E 87 ; Un-lock super I/O

O 4E 87

↓

Select logic device:

O 4E 07

O 4F 08

↓

WDT device enable:

O 4E 30

O 4F 01

↓

Set timer unit:

O 4E F0

O 4F 00 ; (00: Sec; 08:Minute)

↓

Set base timer:

O 4E F1

O 4F 0A ; Set reset time (where 0A (hex) = 10sec)

Disable WDT

↓

Enable configuration:

O 4E 87 ; Un-lock super I/O

O 4E 87

↓

Select logic device:

O 4E 07

O 4F 08

↓

WDT device disable:

O 4E 30

O 4F 00

APPENDIX B
DIO Command

How to Use DIO Registers

Command byte

The command byte is the first byte to follow the address byte during a write transmission. It is used as a pointer to determine which of the following registers will be written or read.

Table 4. Command byte

Command	Register	
0	Input port 0	
~~1~~	~~Input port 1~~	No support
~~2~~	~~Output port 0~~	No support
3	Output port 1	
4	Polarity Inversion port 0	
5	Polarity Inversion port 1	
6	Configuration port 0	
7	Configuration port 1	

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