



®

AXIOMTEK

eBOX800-841-FL Series

Embedded System

User's Manual



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Safety Precautions

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

1. The eBOX800-841-FL does not come with an operating system which must be loaded first before installation of any software into the computer.
2. Be sure to ground yourself to prevent static charge when installing any internal components. Use a wrist grounding 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 eBOX800-841-FL prior to making any installation. Be sure both the system and all external devices are turned OFF. Sudden surge of power could ruin sensitive components. Make sure the eBOX800-841-FL is properly grounded.
4. Make sure the voltage of the power source is correct before connecting it to any power outlet.
5. Turn off 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 equipment in an uncontrolled environment where the storage temperature is below -40°C or above 80°C as it may damage the equipment.
7. 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 discharge any static electricity on human body.
 - When handling boards and components, wear a wrist grounding strap available from most electronic component stores.

Classifications

1. Degree of protection against electric shock: not classified
2. Degree of protection against ingress of water: IP67
3. Equipment not suitable for use in the presence of a flammable anesthetic mixture with air, oxygen or nitrous oxide.
4. Mode of operation: Continuous

General Cleaning Tips

Please keep the following precautions in mind while understanding the details fully before and during any cleaning of the computer and any components within.

A piece of dry cloth is ideal to clean the device.

1. Be cautious of any tiny removable components when using a vacuum cleaner to absorb dirt on the floor.
2. Turn the system off before clean up the computer or any components within.
3. Avoid dropping any components inside the computer or getting circuit board damp or wet.
4. For cleaning, be cautious of all kinds of cleaning solvents or chemicals which may cause allergy to certain individuals.
5. Keep foods, drinks or cigarettes away from the computer.

Cleaning Tools:

Although many companies have created products to help improve the process of cleaning computer and peripherals, users can also use house hold items accordingly for cleaning. Listed below are items available for cleaning computer or computer peripherals.

Pay special attention to components requiring designated products for cleaning as mentioned below.

- 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, it is recommended to use a piece of cloth.
- Water or rubbing alcohol: A piece of cloth may be somewhat moistened with water or rubbing alcohol before being rubbed on the computer. Unknown solvents may be harmful to plastic parts.
- Absorb dust, dirt, hair, cigarette and other particles outside of a computer can be one of the best methods of cleaning a computer. Over time these items may restrict the airflow in a computer and cause circuitry to corrode.
- Cotton swabs: Cotton swaps moistened with rubbing alcohol or water are applicable to reach areas in keyboard, mouse and other areas.
- Foam swabs: If possible, it is better to use lint free swabs such as foam swabs.



【Note】 : *It is strongly recommended that customer should shut down the system before start to clean any single components.*

Please follow the steps below:

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

Scrap Computer Recycling

Please inform the nearest Axiomtek distributor as soon as possible for suitable solutions in case computers require maintenance or repair; or for recycling in case computers are out of order.

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Windows 10, Windows 8.1, Windows 8, Windows 7, Windows XPE, Windows XP, Windows CE embedded, Linux, MS-DOS, Microsoft C and Other brand names and trademarks are the properties and registered brands of their respective owners.

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SECTION 1 INTRODUCTION



This section contains general information and detailed specifications of the eBOX800-841-FL. Section 1 consists of the following sub-sections:

- General Descriptions
- System Specifications
- Dimensions
- I/O Outlets
- Packing List
- Model List

1.1 General Descriptions

The eBOX800-841 comes with Intel® Atom™ E3845 processor (Bay Trail SoC), utilizing a full IP67-rated aluminum die-casting and heavy-duty steel case. It supports Windows 7, Windows 7 Embedded, Windows 10 and Linux.

The fanless and streamlined enclosure ensures excellent heat dissipation. In addition, this reliable box pc is designed to operate under wide temperature ranges from -30°C to 60°C, under wide range of DC power input from 9 to 36VDC and under harsh/outdoor applications with M12 lockable connectors.

Features

1. Fanless with IP67-rated enclosure design
2. Intel® Atom™ E3845 (1.91GHz) quad-core SoC onboard
3. Four antenna openings with waterproof design for WLAN & WWAN usage
4. Wide range of DC power input supported from 9 to 36VDC
5. Flexible I/O for customized designs and mission-critical projects

Reliable and Stable Design

Powered by onboard quad-core processor, the eBOX800-841-FL is equipped with M12 lockable connectors while supporting wall-mount/vest-mount kit for outdoor applications.

Flexible Connectivity

The eBOX800-841-FL features two Gigabit Ethernet ports and two USB 2.0 ports. Additionally, it also supports two RS-232/RS-485 serial interfaces.

Embedded O.S. Supported

The eBOX800-841-FL supports not only Windows 7, Windows 10 but also embedded OS, such as Windows 7 Embedded, Windows 8 Embedded and Linux.

Various Storage Supported

In terms of storage, the eBOX800-841-FL supports one 2.5" SATA storage drive bay and one mSATA device.

1.2 System Specifications

1.2.1 CPU

CPU

- Intel® Atom™ processor E3845 1.91 GHz

Chipset

- SoC integrated

BIOS

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

System Memory

- One 204-pin unbuffered DDR3L-1066/1333MHz SO-DIMM socket, up to 8 GB at the maximum

1.2.2 I/O System

Display

- 1 x VGA connector (M12 A-Code 12 pos Male)
- Resolution max up to 1600 x 1200 x 24

Ethernet

- 2 x 10/100/1000 Ethernet ports (M12 X-Code 8 pos Female)

USB Ports

- 1 x USB connector to 2 x USB 2.0 ports (M12 A-Code 8 pos Male)

Serial Ports

- 2 x RS-232/422/485 (M12 A-Code 8 pos Male)

Mini PCIe Interface

- 1 x full-size PCI Express Mini Card Slots with mSATA supported
- 1 x half-size PCI Express Mini Card Slots

Storage

- 1 x 2.5" SATA HDD/SSD drive bay
- 1 x mSATA (optional)
- 1 x CFast™

Indicator

- 1 x Green LED as indicator for system power on

Switch

- 1 x ATX power switch with indicator
- 1 x Power input (M12 A-Code 5 pos Male)

Antenna

- 4 x Antenna opening N Jack type with waterproof design

1.2.3 System Specifications

Watchdog Timer

- 1~255 seconds or minutes; up to 255 levels.

Power Supply

- 9~36VDC input

Operation Temperature

- -30°C ~ 60°C (-22 °F ~ 140°F), with W.T. SSD & Memory)

Storage Temperature

- -40°C ~ 80°C (-40 °F ~ 176°F)

Humidity

- 10% ~ 90% (non-condensation)

Vibration Endurance

- 3Grm with CFast™ (5-500Hz, X, Y, Z directions)

Weight

- 4.31 kg (9.5 lb) without package
- 5.1 kg (11.24 lb) with package

Dimension

- 210 mm (8.27") (W) x 366.83 mm (14.44") (D) x 83 mm (3.27") (H)

1.2.4 Driver CD Contents

- Ethernet
- Chipset
- Graphic
- Intel Rapid Storage Technology
- Audio
- Intel® TXE Firmware
- User Manual
- Quick Manual

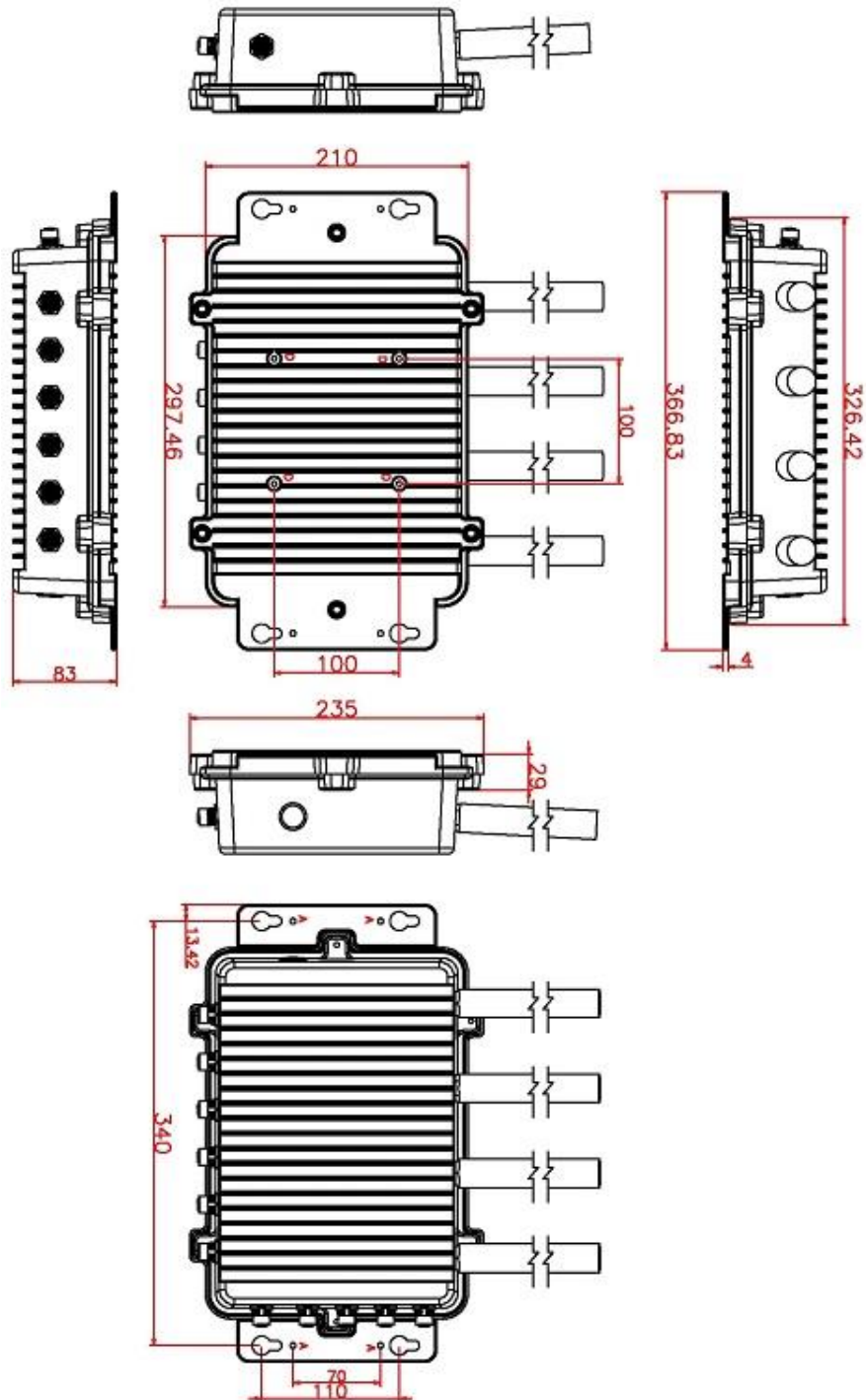


【Note】 : All specifications and images are subject to change without notice.

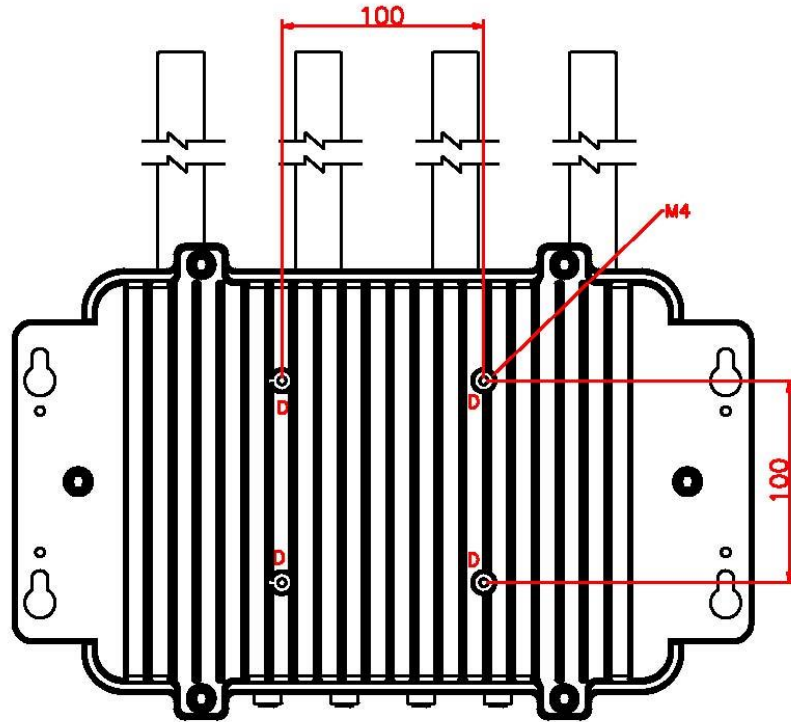
1.3 Dimensions

The following diagrams show dimensions and outlines of the eBOX800-841-FL.

1.3.1 System Dimensions



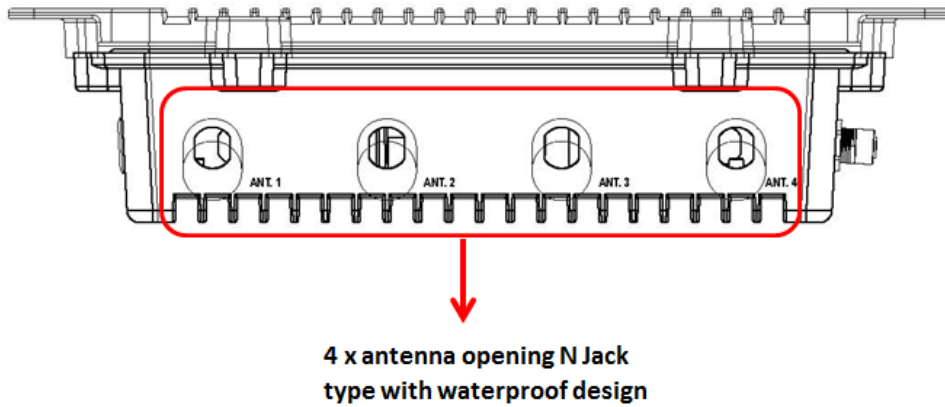
1.3.3 VESA-mount Bracket Dimensions



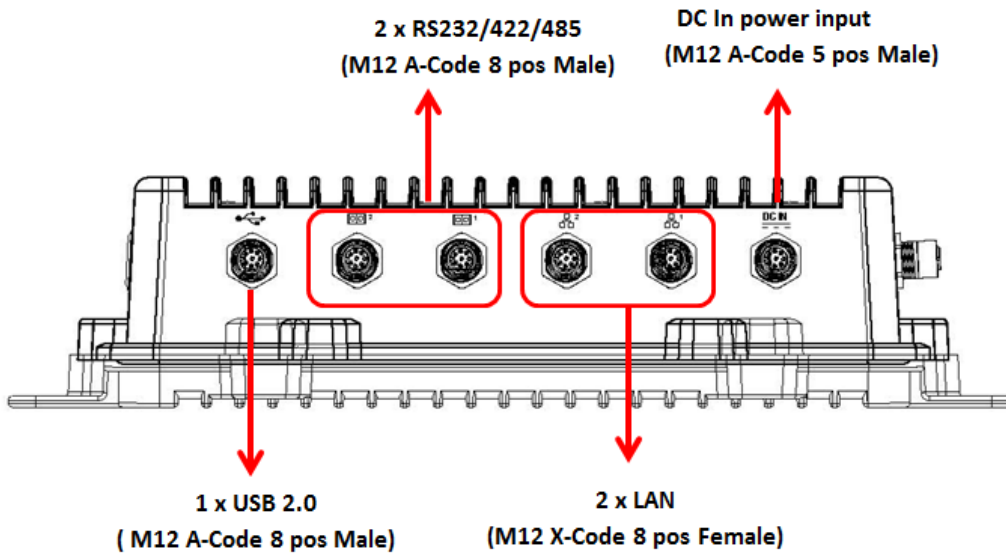
1.4 I/O Outlets

The following figures show I/O outlets on front of the eBOX800-841-FL.

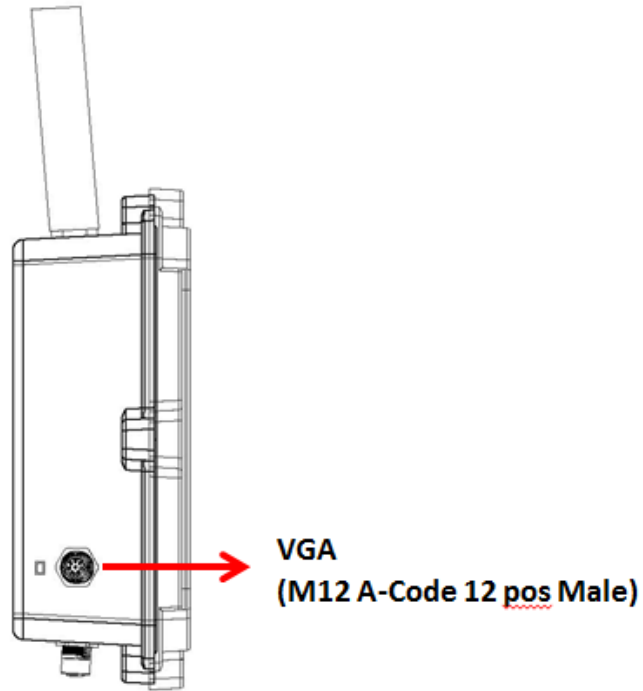
Top View



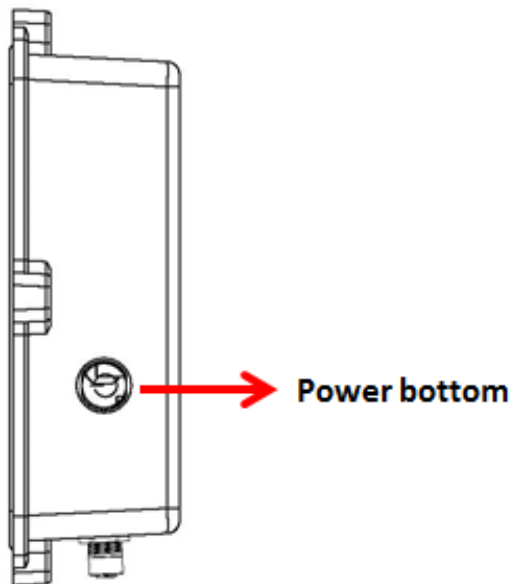
Bottom View



Right side View



Left side View



1.5 Packing List

The eBOX800-841-FL comes with the following bundle package:

- eBOX800-841-FL System Unit x 1
- Quick Installation Guide x 1
- DVD x 1 (For Driver and Manual)
- waterproof PWR cable (L:1m) x 1
- waterproof VGA cable (L:1.8m) x 1
- waterproof USB 2.0 cable (L:1.8m) x 1
- HDD mylar x 1
- HDD screws x 2
- HDD poron x 1

1.6 Model List

eBOX800-841-FL-DC	Rugged IP67-rated fanless embedded system with Intel® Atom™ processor E3845 1.91 GHz, VGA, 2 GbE LANs, 2 USBs, 2 COMs and 9~36VDC power input
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Please contact Axiomtek's distributors immediately in case any abovementioned items are missing.

SECTION 2 HARDWARE INSTALLATION

The eBOX800-841-FL is convenient for various hardware configurations, such as DRAM, HDD (Hard Disk Drive), SSD (Solid State Drive), CFast™ card and PCI Express Mini card modules. Section 2 contains guidelines for hardware installation.

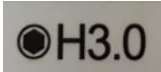
【Note】 :

Waterproof capability may be affected if a system is disassembled; under such circumstances Axiomtek shall not be liable for any quality deterioration.

【Note】 : Please refer to tightening torque below for all system screws:

⊙ HEX socket set screw: 7.5 kgf

HEX KEY specifications are shown below



⊙ N jack connector: 10 kgf



2.1 Installation of 2.5" SATA Device

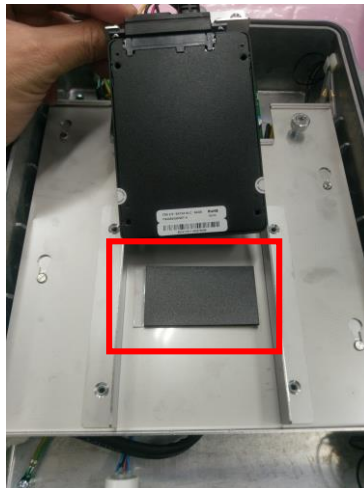
Step 1 Turn off the system and unplug the power cord.

Step 2 Turn the system upside down to locate screws at the bottom and then loosen all screws.



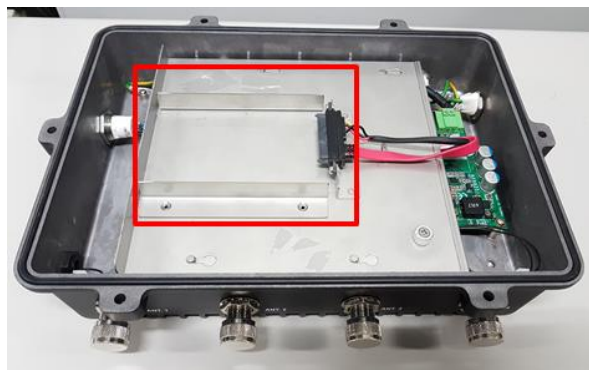
Step 3 Remove the bottom cover.

Step 4 For 7" HDD/SSD, please add a HDD poron before install the HDD/SSD.

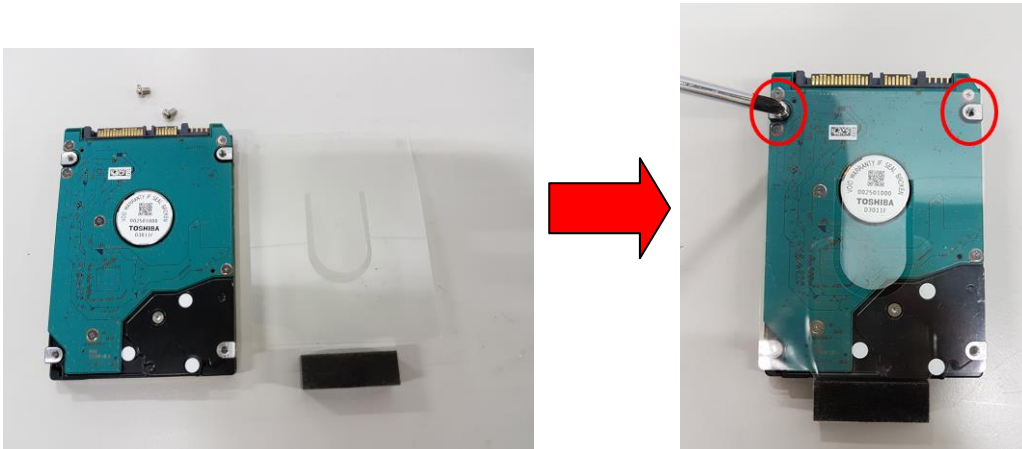


Step 5 Locate SSD/HDD within the red line as marked.

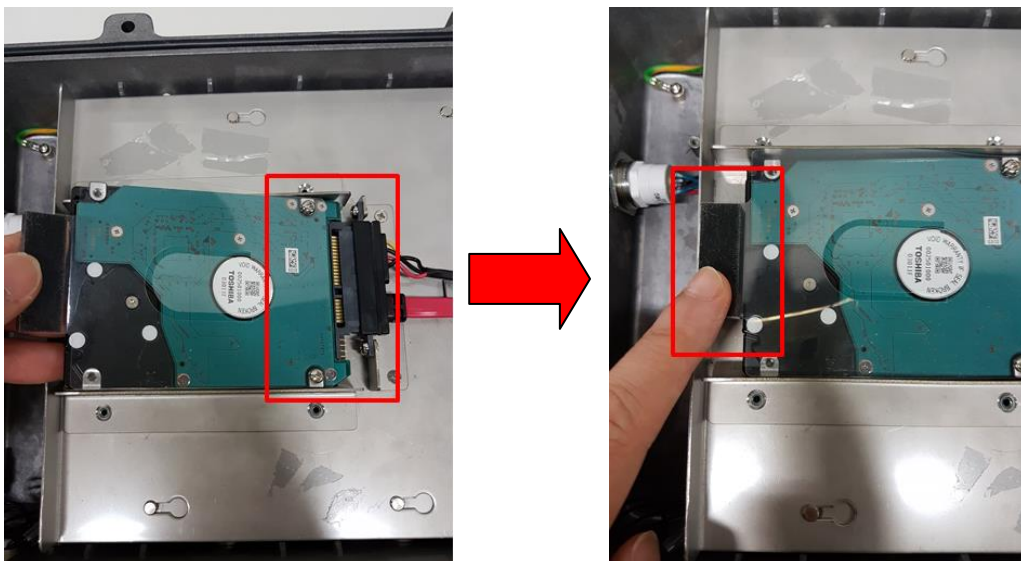
Please notice the direction of connector for HDD.



Step 6 Before install an SSD/HDD, please place the mylar on top of the SSD/HDD and fasten two screws.



Step 7 Install the SSD/HDD into the HDD drive bay and push the poron down to ensure the complete insertion of SSD/HDD.



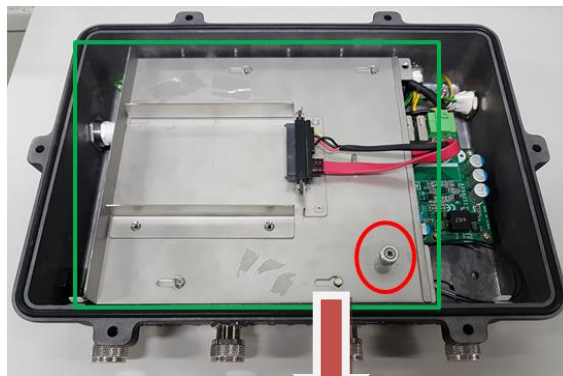
2.2 Installation of SO-DIMM

Step 1 Turn off the system and unplug the power cord.

Step 2 Six screws on the bottom heatsink are used to fasten the heatsink to the chassis.



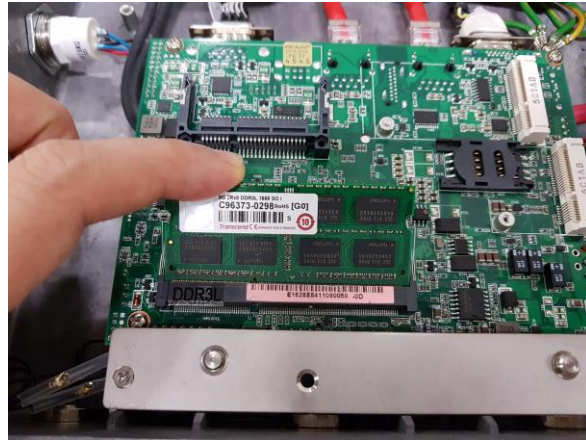
Step 3 Loosen the thumb screws to remove the metal plate then a dual SO-DIMM socket on main board is visible.



Unlock

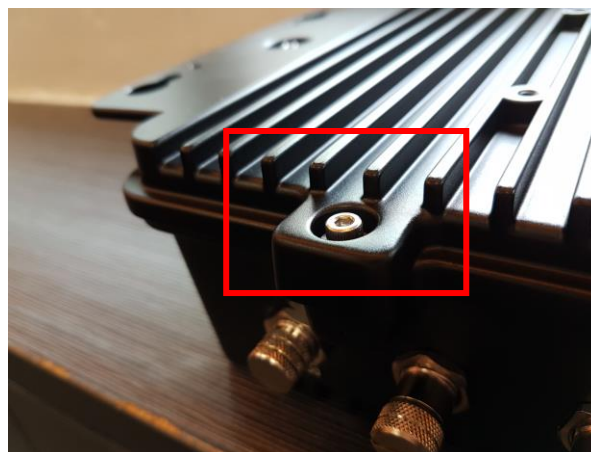


Step 4 Locate the memory module, insert a gold colored contact into the socket and push the module two end latches till locked.



Step 5 Replace the metal plate, fasten the thumb screws, then put the bottom cover and fasten six screws back onto the system.

【Note】 : Make sure all screws are fastened.



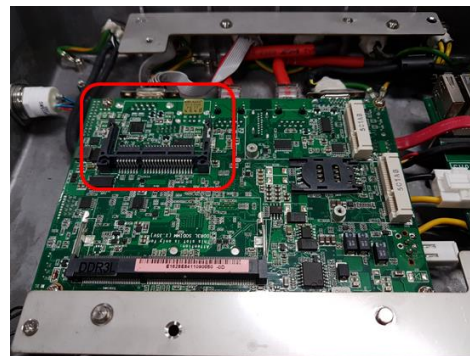
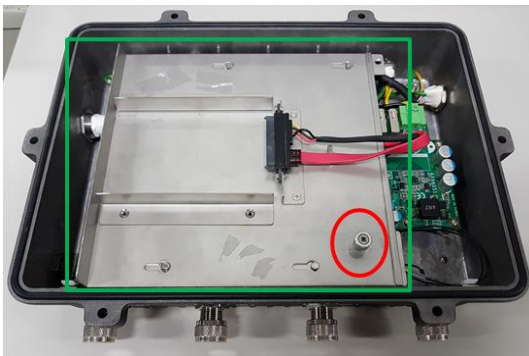
2.3 Installation of CFast™ Module

Step 1 Turn off the system and unplug the power cord.

Step 2 Turn the system upside down to locate screws at the bottom, and then loosen all screws.



Step 3 Loosen the thumb screws to remove the metal plate then locate the CFast™ slot on main board.



Step 4 Insert a CFast™ module into the socket.



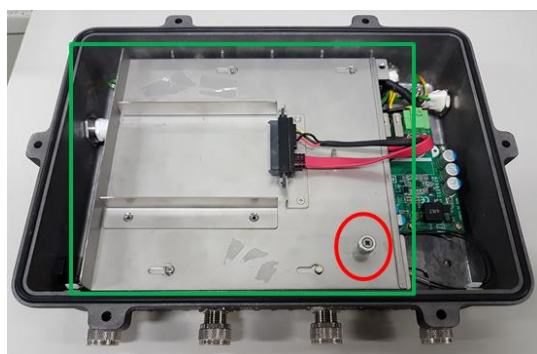
Step 5 Recover and fasten all screws of the metal plate and bottom cover.

2.4 Installation of WI-FI Mini PCIe Module (half-size)

- Step 1 Turn off the system and unplug the power cord.
Step 2 Turn the system upside down to locate screws at the bottom, and then loosen all screws.



- Step 3 Remove the metal plate by loosening the thumb screw, identify the WI-FI, and then insert a WI-FI module.



- Step 4 Connect SMA cable to I-PEX connector of WI-FI module and install Antenna 3 and Antenna 4.



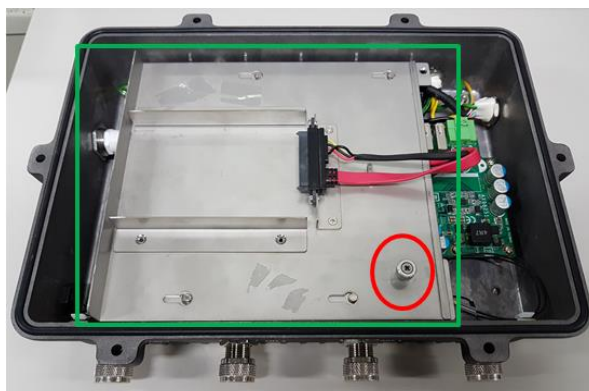
2.5 Installation of 3G/4G Mini PCIe Module (full-size)

Step 1 Turn off the system and unplug the power cord.

Step 2 Turn the system upside down to locate screws at the bottom, and then loosen all screws.



Step 3 Remove the metal plate by loosening the thumb screws, identify the socket, and then insert a 3G/4G module.



Step 4 Connect SMA cable to I-PEX connector of 3G/4G Module and install Antenna 1 and Antenna 2.



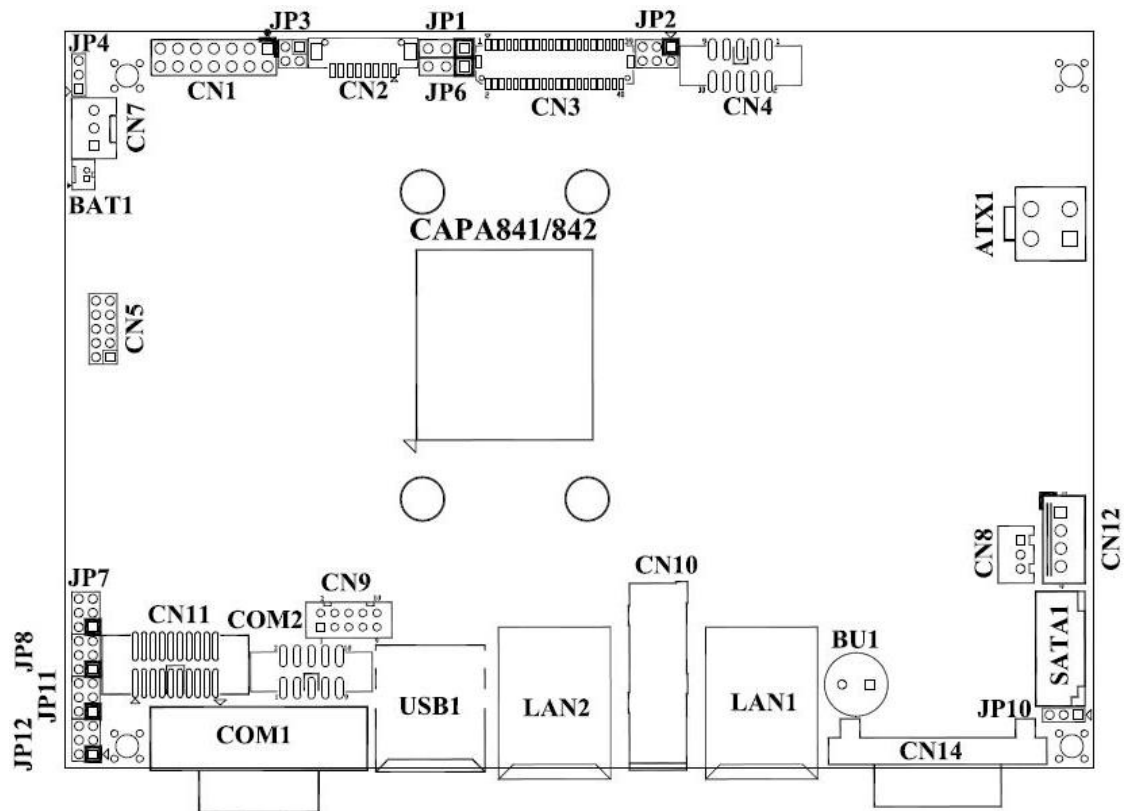
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SECTION 3 JUMPER & CONNECTOR SETTINGS

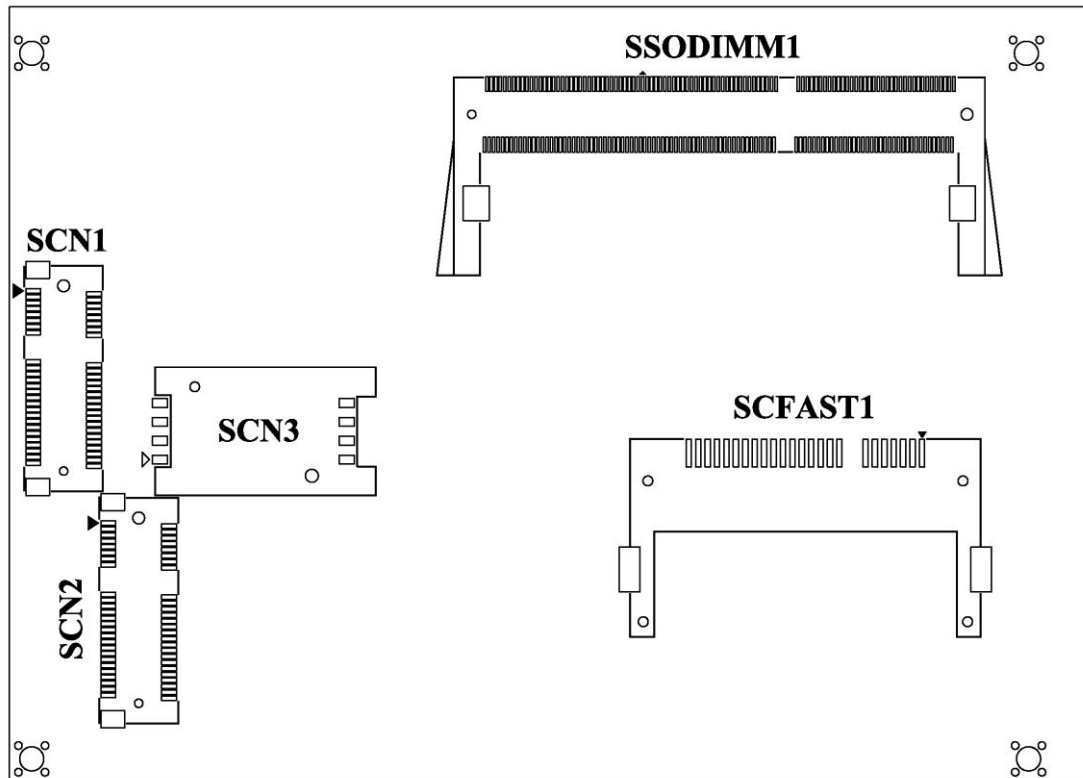
Proper jumper settings configure the eBOX800-841-FL to meet various application needs. Hereby all jumpers settings along with their default settings are listed for devices onboard.

3.1 Locations of Jumpers & Connectors

CAPA841 Top View



CAPA841 Bottom View



【Note】 : *It is strongly recommended that any unmentioned jumper settings should not be modified without instructions by Axiomtek FAEs. Any modifications without instructions might cause system failure.*

3.2 Summary of Jumper Settings

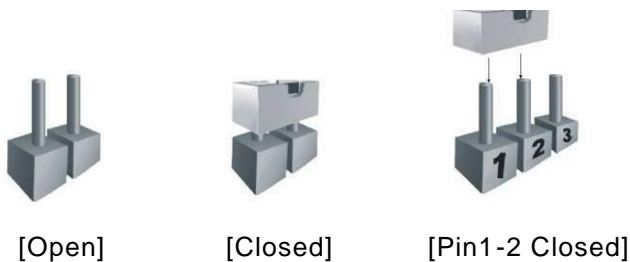
Proper jumper settings configure the eBOX800-841-FL to meet various application purposes. A table of all jumpers and their default settings is listed below.

Jumpers	Descriptions	Settings	
JP4	Restore BIOS Optimal Defaults Default: Normal Operation	1-2 Closed	
JP10	Auto Power On Default: Enable	2-3 Closed	
JP11	COM2 Data/Power Selection Default: RS-232 Data	COM2 Pin 1: DCD	3-5 Closed
		COM2 Pin 8: RI	4-6 Closed
JP12	COM1 Data/Power Selection Default: RS-232 Data	COM1 Pin 1: DCD	3-5 Closed
		COM1 Pin 9: RI	4-6 Closed



【Note】 : How to setup Jumpers

That a cap on a jumper is to “close” the jumper, whereas that offs a jumper is to “open” the jumper.



3.2.1 Restore BIOS Optimal Defaults (JP4)

Put jumper clip to pin 2-3 for a few seconds then move it back to pin 1-2. This procedure is to restore BIOS optimal defaults.

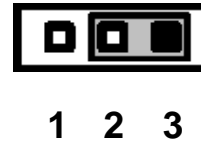
Functions	Settings
Normal (Default)	1-2 closed
Restore BIOS optimal defaults	2-3 closed



3.2.2 Auto Power On (JP10)

If JP10 is enabled for AC power input, the system will be automatically power on without pressing soft power button. If JP10 is disabled for AC power input, it is necessary to manually press soft power button to power on the system

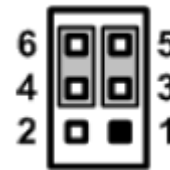
Functions	Settings
Disable auto power on	1-2 closed
Enable auto power on (Default)	2-3 closed



3.2.3 COM 2 Data/Power Selection (JP11)

The COM2 port has +5V level power capability on DCD and +12V level on RI by setting this jumper. When this port is set to +5V or +12V level, please make sure its communication mode is RS-232.

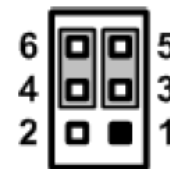
Functions	Settings
Power: Set COM2 pin 1 to +5V level	1-3 closed
Data: Set COM2 pin 1 to DCD (Default)	3-5 closed
Power: Set COM2 pin 8 to +12V level	2-4 closed
Data: Set COM2 pin 8 to RI (Default)	4-6 closed



3.2.4 COM 1 Data/Power Selection (JP12)

The COM1 port has +5V level power capability on DCD and +12V level on RI by setting this jumper. When this port is set to +5V or +12V level, please make sure its communication mode is RS-232.

Functions	Settings
Power: Set COM1 pin 1 to +5V level	1-3 closed
Data: Set COM1 pin 1 to DCD (Default)	3-5 closed
Power: Set COM1 pin 9 to +12V level	2-4 closed
Data: Set COM1 pin 9 to RI (Default)	4-6 closed



3.3 Connectors

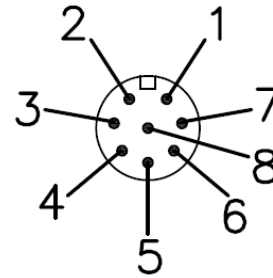
The eBOX800-841-FL has two serial ports, COM1 and COM2 (RS-232/422/485), two Ethernets, two USBs, one VGA and one 9~36VDC connector.

Please refer to pin assignments below:

3.3.1 Serial Port (M12 A-Code 8 pos Male)

The following table shows pin assignments of this connector:

Pins	RS-232	RS-422	RS-485
1	DCD	TX-	Data-
2	RXD	TX+	Data+
3	TXD	RX+	No use
4	DTR	RX-	No use
	GND	GND	GND
5	DSR	No use	No use
6	RTS	No use	No use
7	CTS	No use	No use
8	RI	No use	No use



【Note】 :Each port +5V maximum: 2A, +12V maximum: 1A.

Warning:

According to IP67 warrantee, please indicate specific COM1 settings at the time of placing an order; don't disassemble the system without authorization.

When receiving information via RS-422/485, if there appear some wrong codes, please check whether RS-422/485 is connected to GND at both ends. The standard method of RS-422/485 is to connect GND at both ends and make sure that receiver and transmitter have the common ground.

3.3.2 Ethernet Port (M12 X-Code 8 pos Female)

Connectable via a M12 X-CODE LAN connector, the eBOX800-841-FL may be equipped with a high performance Plug and Play Ethernet interface which is fully compliant with IEEE 802.3 standard.

Please refer to detailed pin assignment listed below:

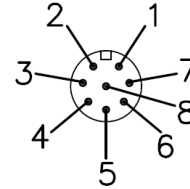
Pins	Signals	Pins	Signals
L1	MDI0P	L5	MDI2P
L2	MDI0N	L6	MDI2N
L3	MDI1P	L7	MDI3P
L4	MDI1N	L8	MDI3N



3.3.3 USB Port (M12 A-Code 8 pos Male)

The USB is a Universal Serial Bus (compliant with USB 2.0 (480 Mbps)) connector on the rear I/O. It is commonly used for installing USB peripherals such as keyboard, mouse, scanner, etc.

Pins	Signals	Pins	Signals
1	USB VCC (+5V level)	5	USB VCC (+5V level)
2	USB #0_D-	6	USB #1_D-
3	USB #0_D+	7	USB #1_D+
4	GND	8	GND



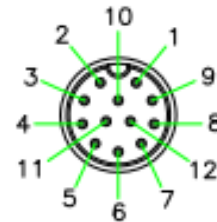
3.3.4 DC Power Jack Connector (M12 A-Code 5 pos Male)

Pins	Signals
1	9~36V
2	9~36V
3	GND
4	GND
5	Earth Ground



3.3.5 VGA Connector (M12 A-Code 12 pos Male)

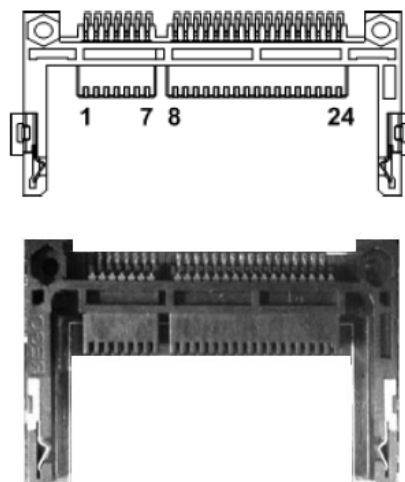
Pins	Signals	Pins	Signals
1	Red	7	Vertical Sync
2	Green	8	DDC CLK
3	Blue	9	VCC
4	DDC DATA	10	GND
5	Horizontal Sync	11	GND
6	DETECT	12	GND



3.3.6 CFast™ Socket (SCFAST1)

The system is equipped with a CFast™ socket on the bottom side to support a CFast™ card which is based on the SATA bus. The socket is specially designed to avoid incorrect installation of the CFast™ card. When installing or removing the CFast™ card, please make sure the system power is off. The CFast™ card by default identifies itself as C: or D: drive in PC system.

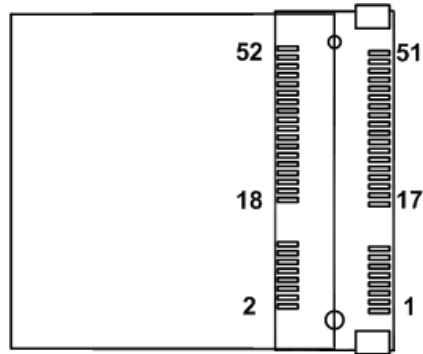
Pins	Signals	Pins	Signals
1	GND	13	N.C
2	SATA_TX+	14	GND
3	SATA_TX-	15	N.C
4	GND	16	CFAST_LED#
5	SATA_RX-	17	N.C
6	SATA_RX+	18	N.C
7	GND	19	N.C
8	N.C	20	+3.3V Level
9	GND	21	+3.3V Level
10	N.C	22	GND
11	N.C	23	GND
12	N.C	24	N.C



3.3.7 Half-Size PCI-Express Mini Card Connector (SCN1)

The SCN1 is a half-size PCI-Express Mini Card connector. It supports the PCI-Express Mini Cards which are applied to either PCI-Express x1 or USB. It complies with PCI-Express Mini Card Spec. V1.2.

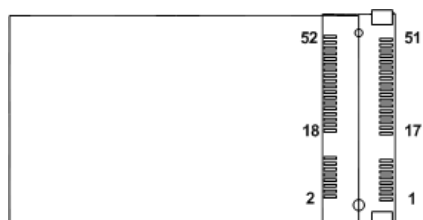
Pins	Signals	Pins	Signals
1	WAKE#	2	+3.3VSB
3	No use	4	GND
5	No use	6	+1.5V
7	CLKREQ#	8	No use
9	GND	10	No use
11	REFCLK-	12	No use
13	REFCLK+	14	No use
15	GND	16	No use
17	No use	18	GND
19	No use	20	W_DISABLE #
21	GND	22	PERST#
23	PE_RXN3	24	+3.3VSB
25	PE_RXP3	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PE_TXN3	32	SMB_DATA
33	PE_TXP3	34	GND
35	GND	36	USB_D8-
37	GND	38	USB_D8+
39	+3.3VSB	40	GND
41	+3.3VSB	42	No use
43	GND	44	No use
45	No use	46	No use
47	No use	48	+1.5V
49	No use	50	GND
51	No use	52	+3.3VSB



3.3.8 Full-Size PCI-Express Mini Card Connector (SCN2)

This is a PCI-Express Mini Card connector on the bottom side applying to either PCI-Express or USB 2.0 or SATA (mSATA). It complies with PCI-Express Mini Card Spec.V1.2. It can also support mSATA cards.

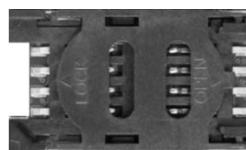
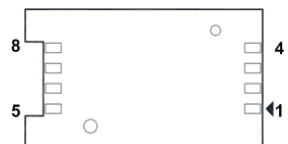
Pins	Signals	Pins	Signals
1	WAKE#	2	+3.3VSB
3	No use	4	GND
5	No use	6	+1.5V
7	CLKREQ#	8	No use
9	GND	10	No use
11	REFCLK-	12	No use
13	REFCLK+	14	No use
15	GND	16	No use
17	No use	18	GND
19	No use	20	W_DISABLE #
21	GND	22	PERST#
23	PE_RXN3/ SATA_RXP	24	+3.3VSB
25	PE_RXP3/ SATA_RXN	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PE_TXN3/ SATA_TXN	32	SMB_DATA
33	PE_TXP3/ SATA_TXP	34	GND
35	GND	36	USB_D8-
37	GND	38	USB_D8+
39	+3.3VSB	40	GND
41	+3.3VSB	42	No use
43	GND	44	No use
45	No use	46	No use
47	No use	48	+1.5V
49	No use	50	GND
51	No use	52	+3.3VSB



3.3.9 SIM Card Socket (SCN3)

This board has SCN3 socket on the bottom side for inserting SIM Card. In order to work properly, the SIM card must be used together with 3G module which is inserted to SCN1 or SCN2. It is mainly used in 3G wireless network applications.

Pins	Signals
1	PWR
2	RST
3	CLK
4	NC
5	GND
6	VPP
7	I/O
8	NC




3.3.10 Waterproof Cables

The eBOX800-841-FL series uses specific M12 connector for waterproof as enclosed in the accessory box; included in the box are also VGA, USB, LAN and Power cables. Please refer to pictures below for cables pin definitions.

Power Cable



Pins	Signals
V+	9~36VDC power input
	Earth Ground
GND	GND
GND	GND



COM Cable

There are two COM cables which are combined M12 connectors. Also, please refer to selection 3.3.1 for series port pin assignments.



USB Cable

With two extended USB ports, the USB cable is combined with M12 connectors for waterproof.



VGA Cable



SECTION 4

BIOS SETUP UTILITY

This section provides users with detailed descriptions in terms of how to set up basic system configurations through the BIOS setup utility.

4.1 Starting

To enter the setup screens, follow the steps below:

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

It is strongly recommended that users should avoid changing the chipset's defaults. Both AMI and system manufacturer have carefully set up these defaults that provide the best performance and reliability.

4.2 Navigation Keys

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include <F1>, <F2>, <Enter>, <ESC>, <Arrow> keys, and so on.

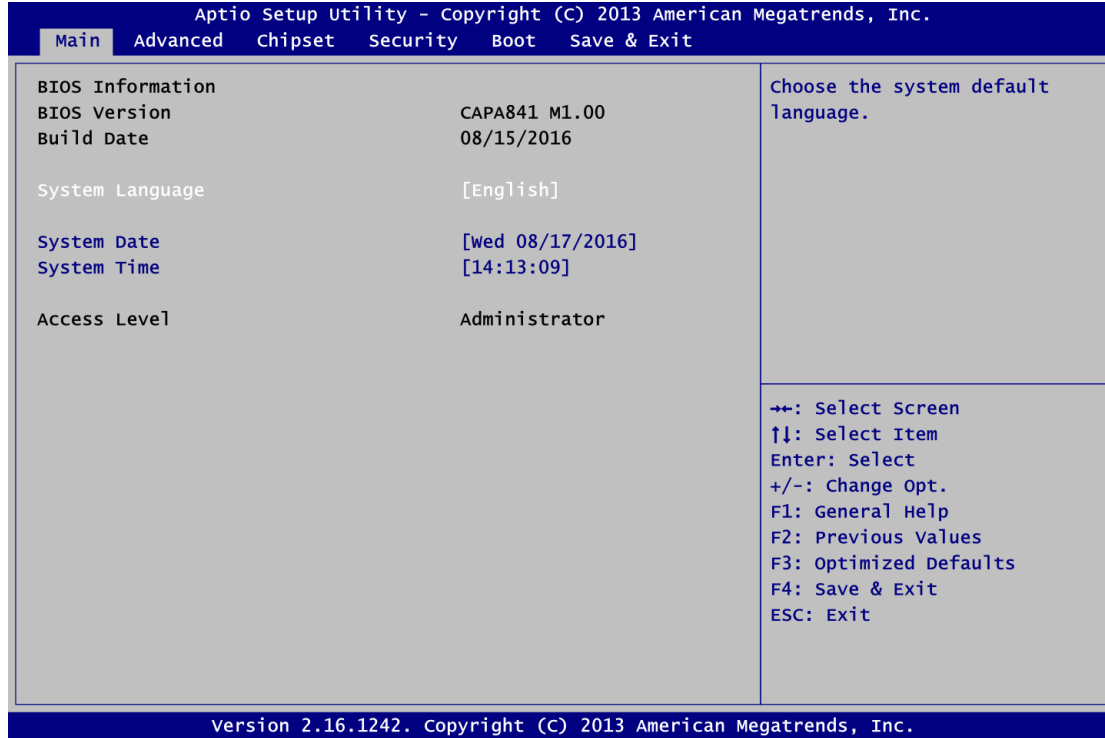


【Note】 : Some of the navigation keys differ from one screen to another.

Hot Keys	Descriptions
→← Left/Right	The Left and Right <Arrow> keys allow users to select a setup screen.
↑↓ Up/Down	The Up and Down <Arrow> keys allow users to select a setup screen or sub-screen.
+– Plus/Minus	The Plus and Minus <Arrow> keys allow users to change the field value of a particular setup item.
Tab	The <Tab> key allows users to select setup fields.
F1	The <F1> key allows users to display the General Help screen.
F2	The <F2> key allows users to Load Previous Values.
F3	The <F3> key allows users to Load Optimized Defaults.
F4	The <F4> key allows users to save any changes they made and exit the Setup. Press the <F4> key to save any changes.
Esc	The <Esc> key allows users to discard any changes they made and exit the Setup. Press the <Esc> key to exit the setup without saving any changes.
Enter	The <Enter> key allows users to display or change the setup option listed for a particular setup item. The <Enter> key can also allow users to display the setup sub- screens.

4.3 Main Menu

The Main Menu screen is the first screen users see when entering the setup utility. Users can always return to the Main setup screen by selecting the Main tab. System Time/Date can be set up as described below. The Main BIOS setup screen is also shown below.



BIOS Information

Display the auto-detected BIOS information.

System Language

Choose the system default language.

System Date/Time

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

Access Level

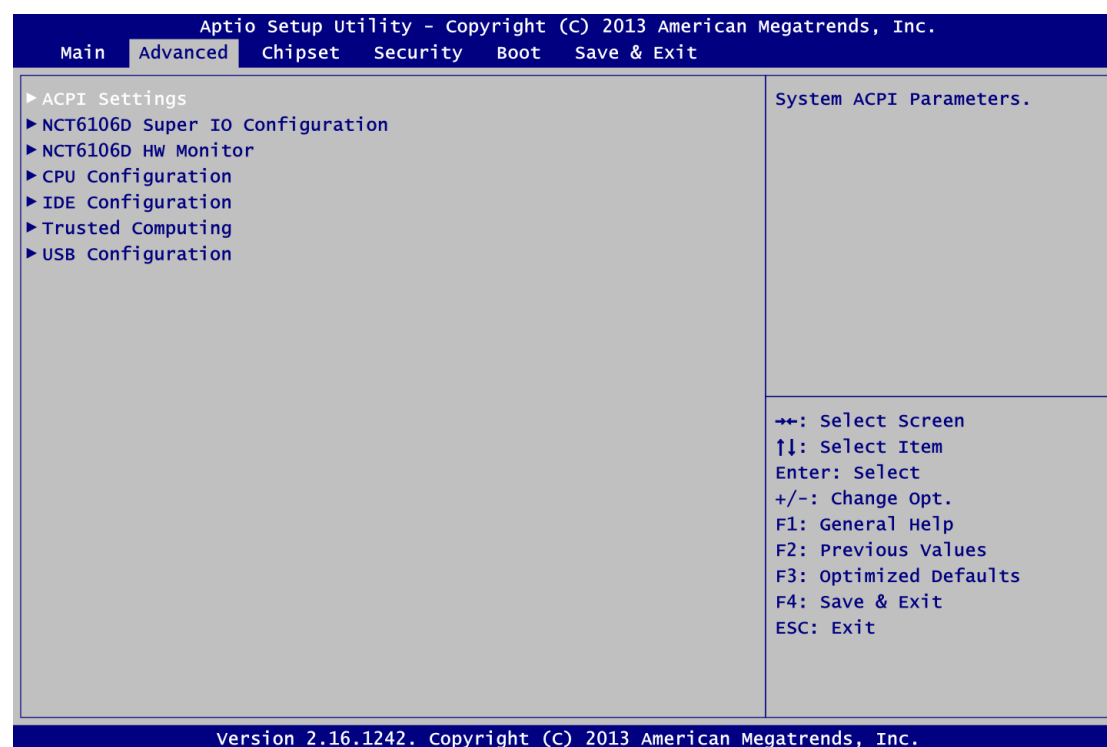
Display the access level of current user.

4.4 Advanced Menu

The Advanced menu also allows users to set configuration of the CPU and other system devices. Users can select any items in the left frame of the screen to go to sub menus:

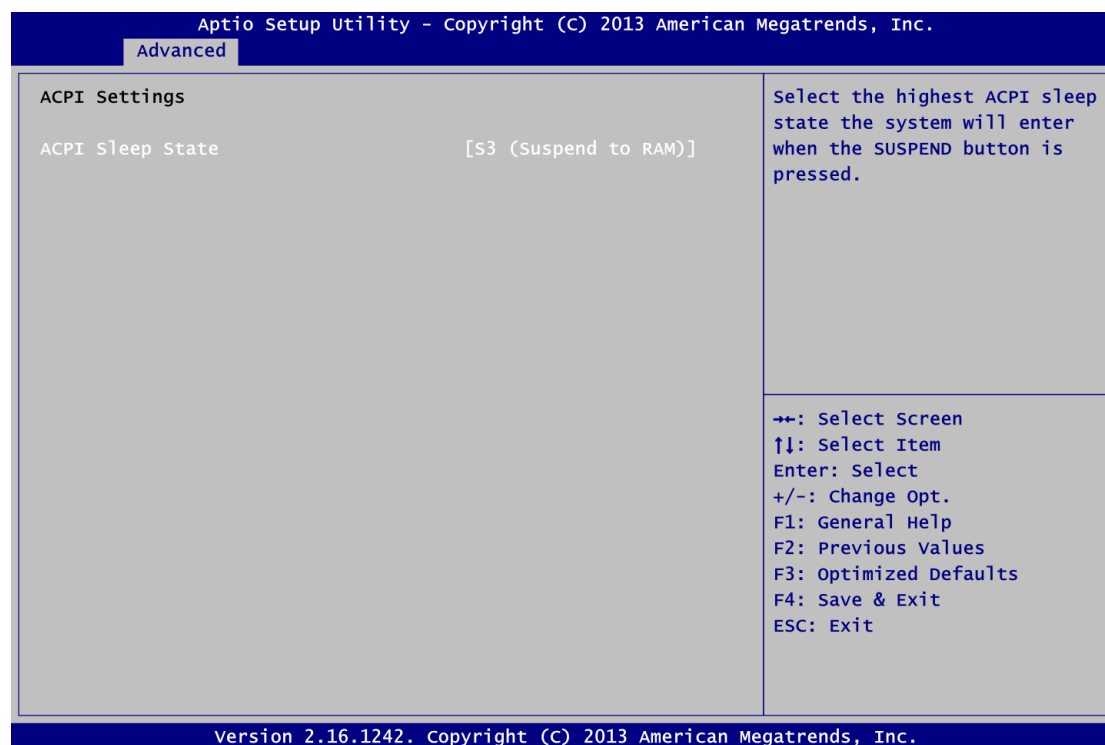
- ▶ ACPI Settings
- ▶ NCT6106D Super IO Configurations
- ▶ NCT6106D HW Monitor
- ▶ CPU Configurations
- ▶ IDE Configurations
- ▶ Trusted Computing
- ▶ USB Configurations

For items marked with “▶”, please press <Enter> for more options.



ACPI Settings

Use this screen to select options for the ACPI configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.

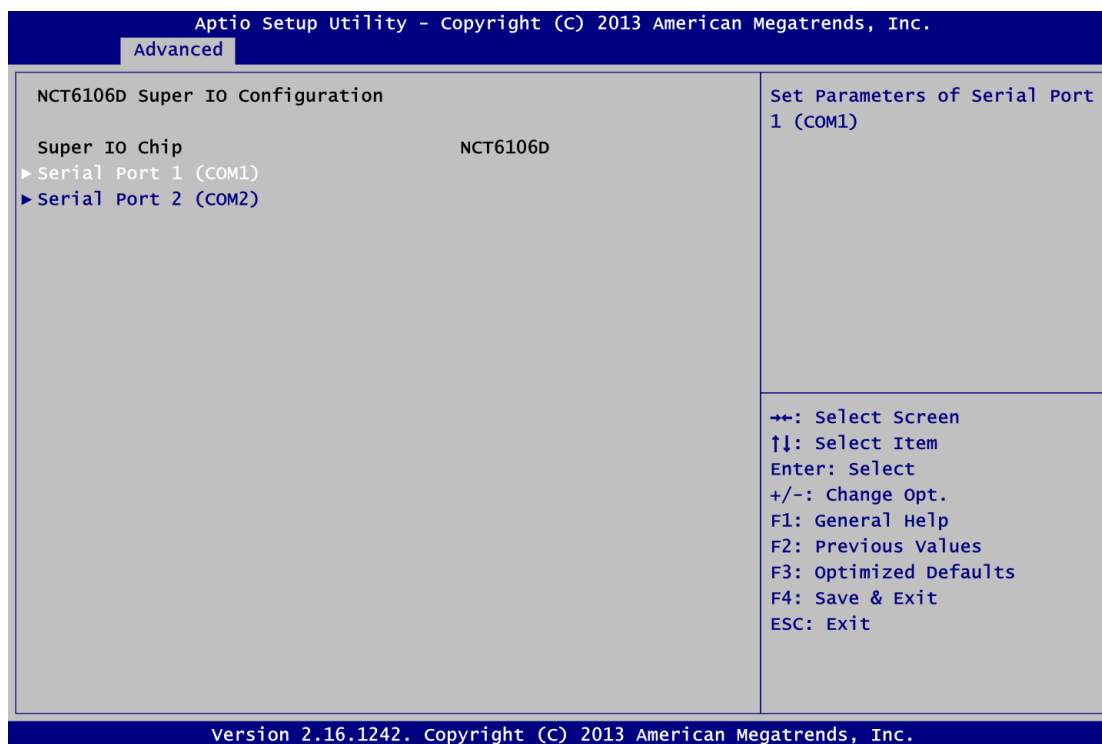


ACPI Sleep State

When the sleep button is pressed, the system will be in the ACPI sleep state. The default is S3 (Suspend to RAM).

NCT6106D Super IO Monitor

Use this screen to select options for the Super IO Configurations, and change the value of the selected option. A description of the selected item appears on the right side of the screen. For items marked with “▶”, please press <Enter> for more options



Serial Port 1~2 (COM1~2) Configurations

Use these items to set parameters related to serial ports 1~2.

Serial Port 1 (COM1)

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.

Advanced

Serial Port 1 (COM1)		COM Port Type: RS232, RS422, RS485
Serial Port	[Enabled]	
Device Settings	IO=3F8h; IRQ=4;	
COM Port Type	[RS232]	

COM Port Type

- RS232
- RS422
- RS485

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

Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.

Serial Port

Enable or disable serial port 1. The optimal setting for base I/O address is 3F8h and for Interrupt request address is IRQ4.

COM Port Type

Use this option to set RS-232/RS-422/RS-485 mode.

NCT6106D HW Monitor

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.

Advanced

Pc Health Status

System temperature	:	+46.0 C
CPU temperature	:	+75.0 C
VCORE	:	+0.856 V
+3.3V	:	+3.328 V
+12V	:	+12.192 V
+5V	:	+5.088 V

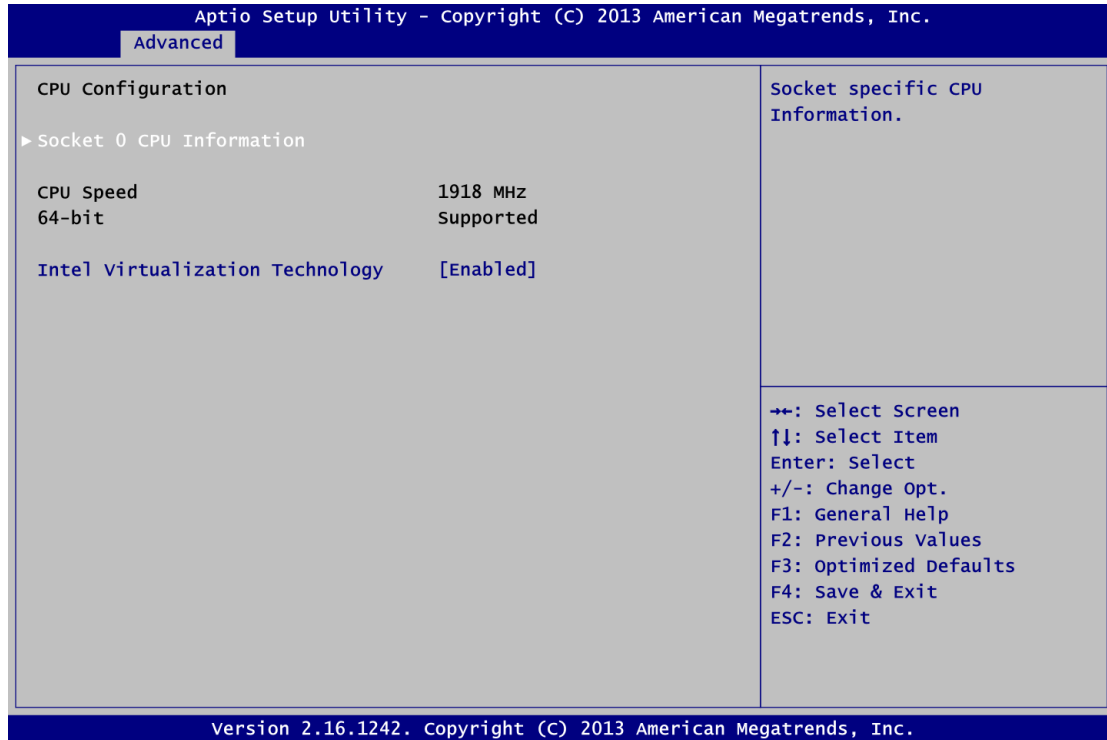
→+: Select Screen
↑↓: Select Item
Enter: select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.

This screen displays the temperature of system and CPU, system voltages (VCORE, +3.3V, +12V and +5V).

CPU Configurations

This screen shows the CPU information.



Socket 0 CPU Information

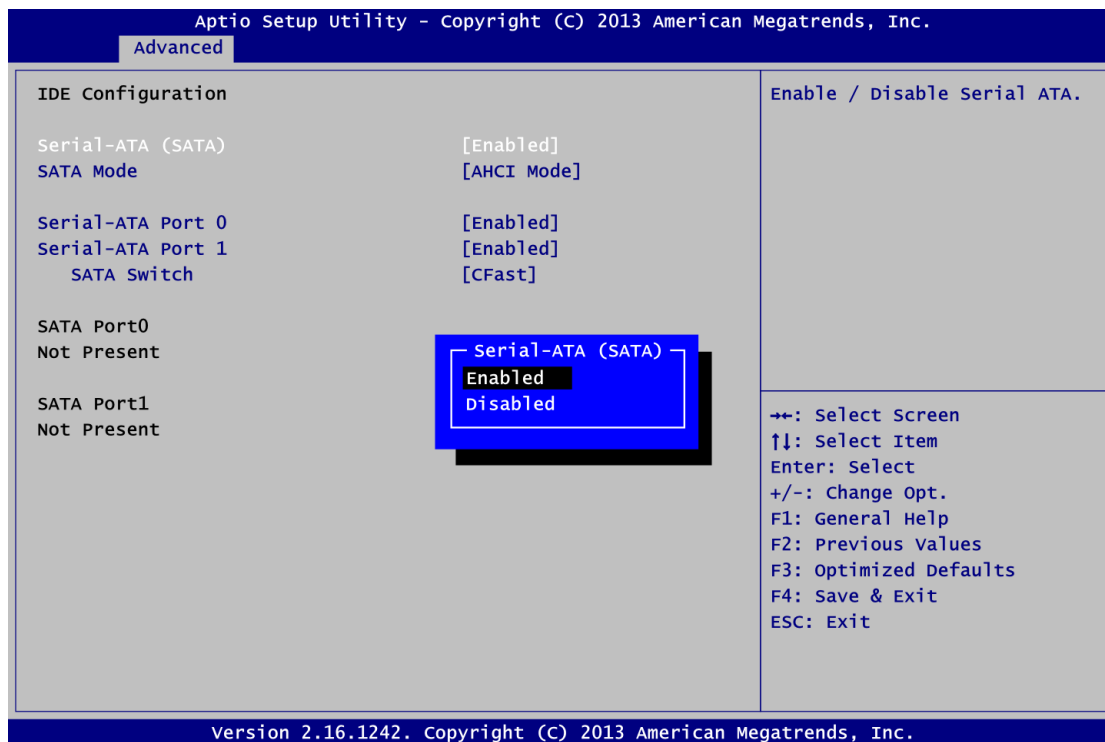
This item is for socket specific CPU information.

Intel Virtualization Technology

It allows a hardware platform to run multiple operating systems separately and simultaneously, enabling one system to virtually function as several systems.

IDE Configurations

This screen shows the IDE configurations.



Serial-ATA (SATA)

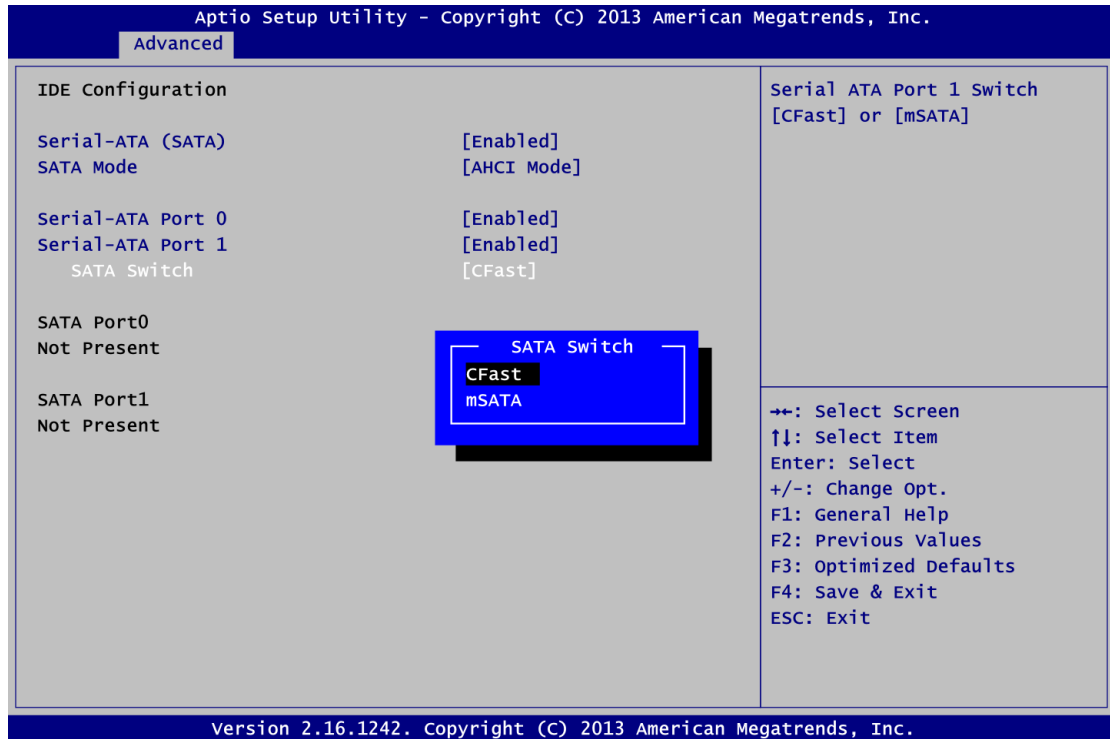
Enable or disable the SATA Controller features. The default is Enabled.

SATA Mode Selection

Determine how SATA controller(s) operates. Operation mode options are IDE Mode and AHCI (Advanced Host Controller Interface) Mode; the latter is the default mode.

Serial-ATA Port 0

Enable or disable the onboard SATA port 0.



Serial-ATA Port 1

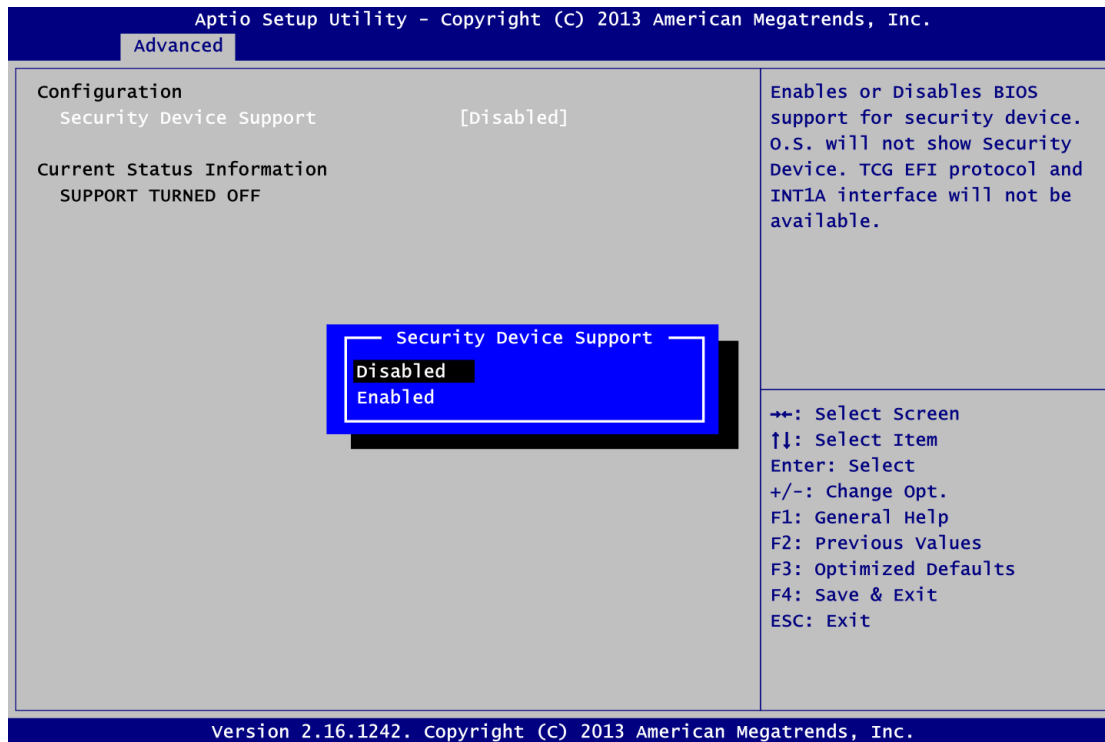
Enable or disable the onboard SATA port 1.

SATA Switch

This option appears only after SATA port 1 is enabled. The default is CFast™. If users intend to insert mSATA card to SCN2, please change setting to mSATA.

Trusted Computing

This screen specifies TPM settings.



Security Device Support

Enable or disable BIOS support for security device. The default setting is Disabled.

Current Status Information

Display current TPM status information.

USB Configurations

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.

Advanced

USB Configuration		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.
USB Module Version	8.10.27	
USB Devices:		
1 Keyboard, 3 Hubs		
Legacy USB Support	[Enabled]	

Legacy USB Support

- Enabled
- Disabled
- Auto

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

Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.

USB Devices

Display all detected USB devices.

Legacy USB Support

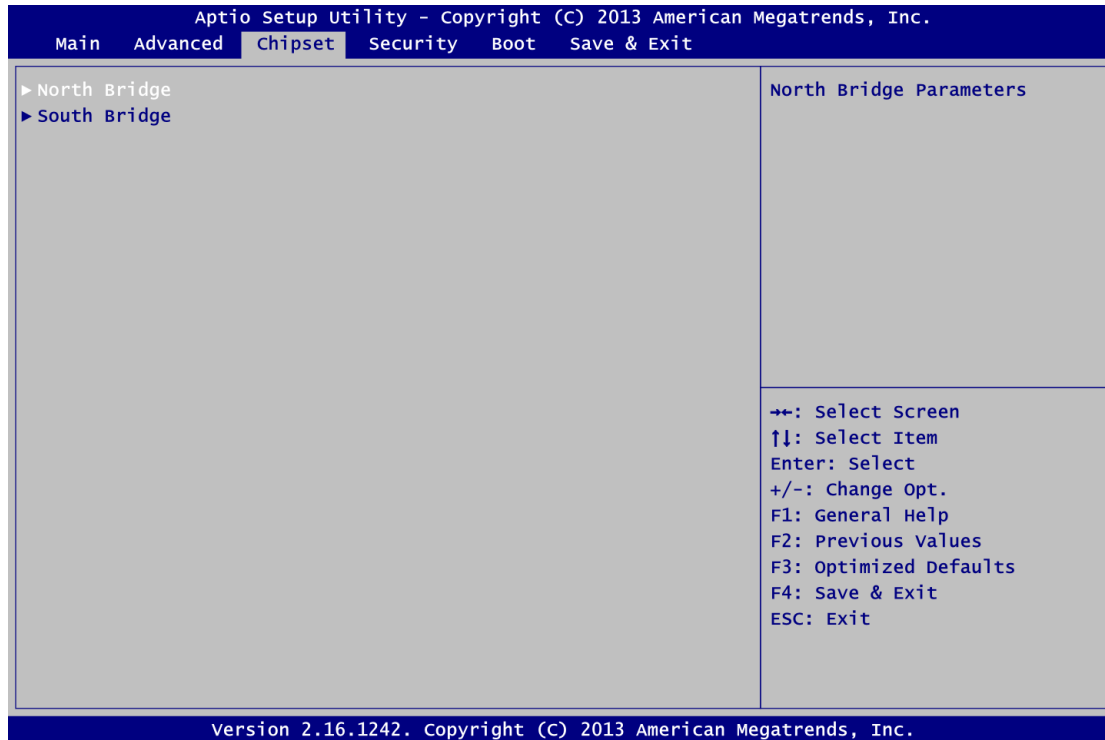
Use this item to enable or disable support for USB device on legacy operating system. The default setting is Enabled. Auto option disables legacy support if no USB devices are connected, Disable option will keep USB devices available only for EFI applications.

4.5 Chipset Menu

The Chipset menu allows users to change the advanced chipset settings. Users can select any of the items in the left frame of the screen to go to the sub menus:

- ▶ North Bridge
- ▶ South Bridge

For items marked with “▶”, please press <Enter> for more options.



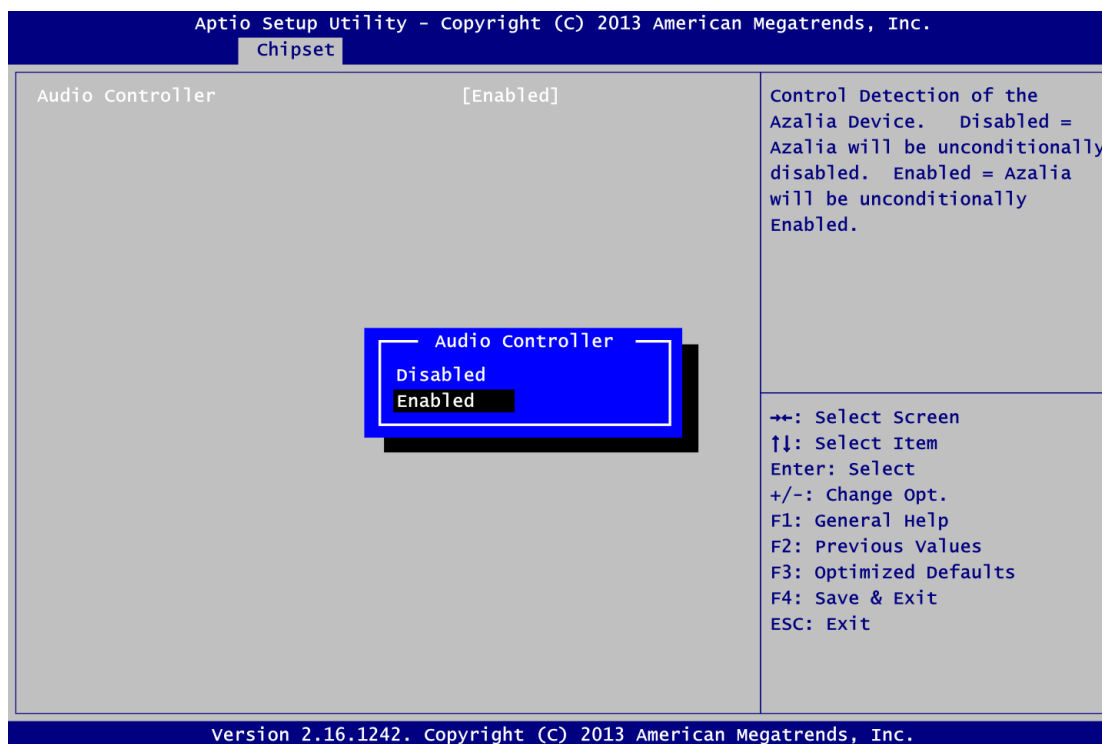
North Bridge

This screen shows memory information. For items marked with "▶", please press <Enter> for more options.

The screenshot displays the BIOS setup utility interface. At the top, a dark blue header contains the text "Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc." and a sub-menu "Chipset". The main area is a light gray box with a border. On the left, under the heading "Memory Information", there are two lines of text: "Total Memory 8192 MB (LPDDR3)" and "Memory Slot0 8192 MB (LPDDR3)". On the right side of this box, there is a list of navigation instructions: "←→: Select Screen", "↑↓: Select Item", "Enter: Select", "+/-: Change Opt.", "F1: General Help", "F2: Previous Values", "F3: Optimized Defaults", "F4: Save & Exit", and "ESC: Exit". At the bottom of the screen, a dark blue footer contains the text "Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc."

South Bridge

This screen allows users to configure parameters of South Bridge chipset.



Audio Controller

Control detection of any Azalia device.

Disabled - Azalia will be unconditionally disabled.

Enabled - Azalia will be unconditionally enabled.

Security Menu

Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.					
Main Advanced Chipset Security Boot Save & Exit					
<p>Password Description</p> <p>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:</p> <table> <tr> <td>Minimum length</td> <td>3</td> </tr> <tr> <td>Maximum length</td> <td>20</td> </tr> </table> <p>Administrator Password User Password</p>	Minimum length	3	Maximum length	20	<p>Set Administrator Password</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>
Minimum length	3				
Maximum length	20				
Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.					

Administrator Password

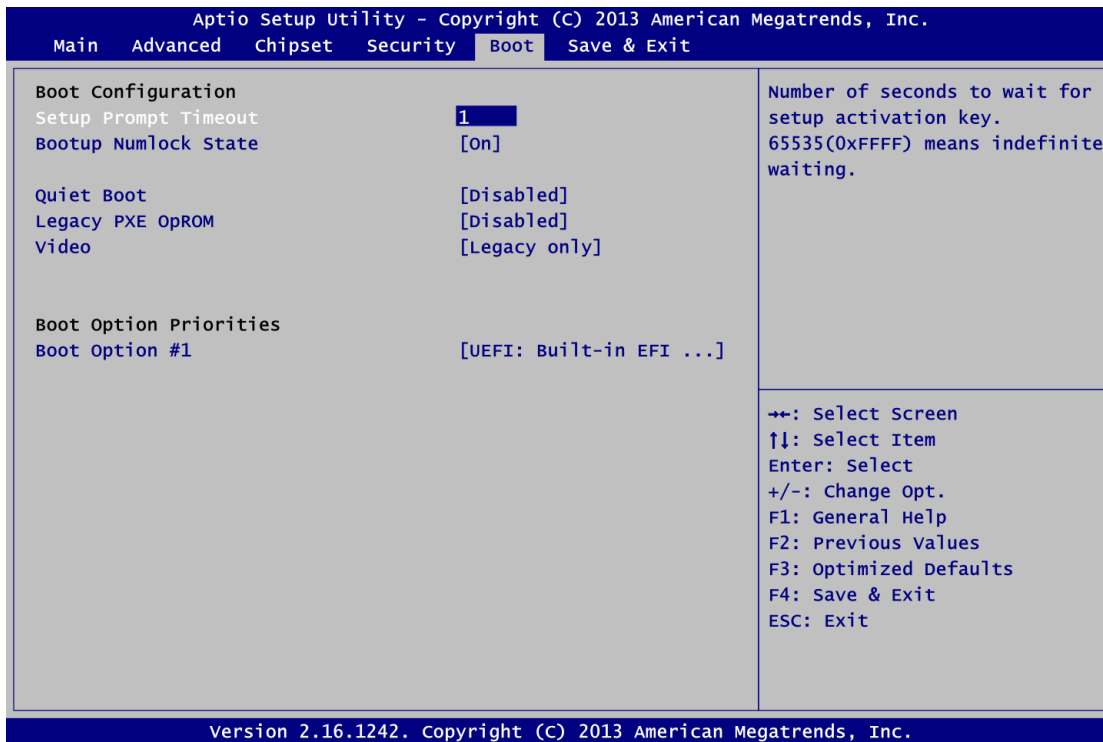
This item indicates whether an administrator password has been set (installed or uninstalled).

User Password

This item indicates whether a user password has been set (installed or uninstalled).

4.6 Boot Menu

The Boot menu allows users to change boot options of the system.



Setup Prompt Timeout

Use this item to set up number of seconds to wait for setup activation key where 65535(0xFFFF) means indefinite waiting.

Bootup NumLock State

Use this item to select the power-on state for the keyboard NumLock.

Quiet Boot

Select to display either POST output messages or a splash screen during boot-up.

Legacy PXE OpROM

Use this item to enable or disable the boot ROM function of the onboard LAN chip when the system boots up.

Vedio

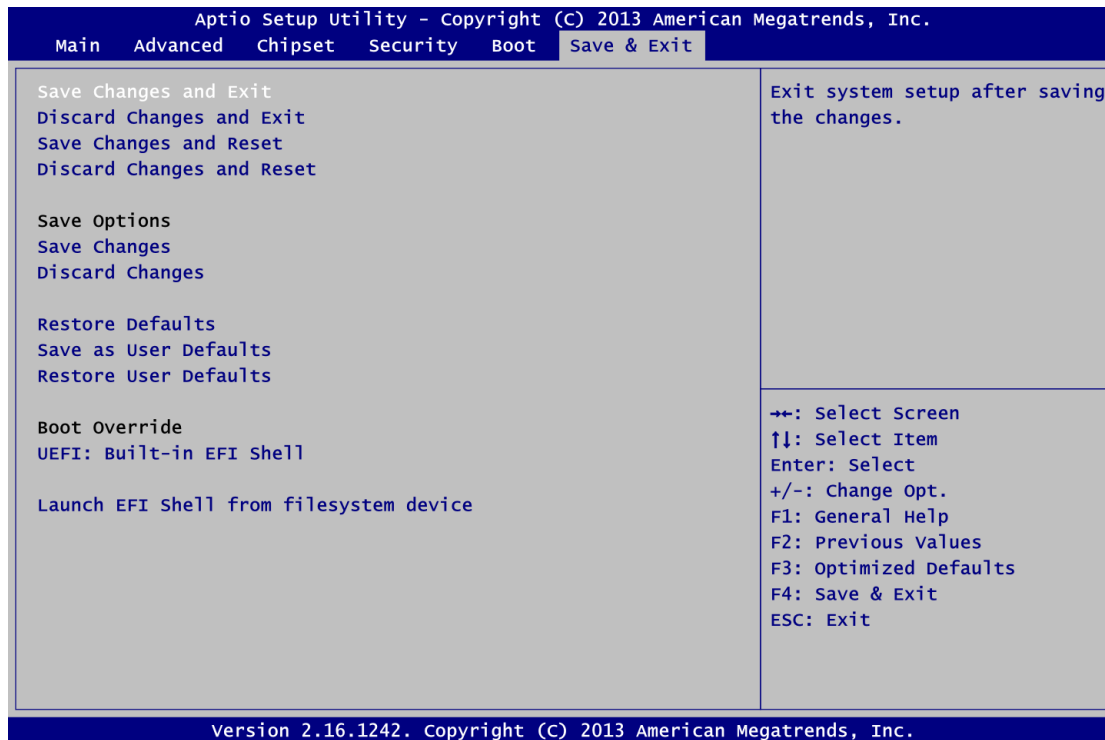
Control the execution of UEFI and legacy video OpROM

Boot Option Priorities

These are settings for boot priority. Specify the boot device priority sequence from the available devices.

4.7 Save & Exit Menu

The Save & Exit menu allows users to load system configurations with optimal or fail-safe default values.



Save Changes and Exit

When users have completed the system configuration changes, select this option to leave Setup and return to Main Menu. Select Save Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to save changes and exit.

Discard Changes and Exit

Select this option to quit Setup without making any permanent changes to the system configurations and return to Main Menu. Select Discard Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to discard changes and exit.

Save Changes and Reset

When completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configurations take effect. Select Save Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to save changes and reset.

Discard Changes and Reset

Select this option to quit Setup without making any permanent changes to the system configuration and reboot the computer. Select Discard Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to discard changes and reset.

Save Changes

When completed the system configuration changes, select this option to save changes. Select Save Changes from the Save & Exit menu and press <Enter>. Select Yes to save changes.

Discard Changes

Select this option to quit Setup without making any permanent changes to the system configurations. Select Discard Changes from the Save & Exit menu and press <Enter>. Select Yes to discard changes.

Restore Defaults

It automatically sets all Setup options to a complete set of default settings when users select this option. Select Restore Defaults from the Save & Exit menu and press <Enter>.

Save as User Defaults

Select this option to save system configuration changes done so far as User Defaults. Select Save as User Defaults from the Save & Exit menu and press <Enter>.

Restore User Defaults

It automatically sets all Setup options to a complete set of User Defaults when users select this option. Select Restore User Defaults from the Save & Exit menu and press <Enter>.

Boot Override

Select a drive to immediately boot that device regardless of the current boot order.

Launch EFI Shell from filesystem device

Attempt to launch EFI Shell application (Shellx64.efi) from one of the available file system devices.

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APPENDIX A WATCHDOG TIMER

About Watchdog Timer

Software stability is major issue in most applications. Some embedded systems are not watched by human for 24 hours. It is usually too slow to wait for someone to reboot when computer hangs. The systems need to be able to reset automatically when things go wrong. The watchdog timer gives us solutions in this regard.

The watchdog timer is a counter that triggers a system to reset when it counts down to zero from a preset value. The software starts the counter with an initial value and must reset it periodically. If the counter ever reaches zero, it means the software has crashed, the system will reboot.

Sample Program

The following example enables configurations using debug tool.

Enable WDT

↓

Enable configuration:

2E 87; Un-lock super I/O

2E 87

↓

Select logic device:

2E 07

2F 08

↓

WDT device enable:

2E 30

2F 01

↓

Set timer unit:

2E F0

2F 00 ; (00: Sec; 08:Minute)

↓

Set base timer:

2E F1

2F 0A; Set reset time (where 0A (hex) = 10sec)

Disable WDT

↓

Enable configuration:

2E 87; Un-lock super I/O

2E 87

↓

Select logic device:

2E 07

2F 08

↓

WDT device disable:

2E 30

2F 00