Embedded Board

BNX-M81

User Manual

Copyright

Trademarks

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FCC and DOC Statement on Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

Notice:
1. The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
2. Shielded interface cables must be used in order to comply with the emission limits.

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Warranty

1. Warranty does not cover damages or failures that are raised from misuse of the product, inability to use the product, unauthorized replacement or alteration of components and product specifications.
2. The warranty is void if the product has been subject to physical abuse, improper installation, modification, accidents or unauthorized repair of the product.
3. Unless otherwise instructed in this user's manual, the user may not, under any circumstances, attempt to perform service, adjustments or repairs on the product, whether in or out of warranty. It must be returned to the purchase point, factory or authorized service agency for all such work.
4. We will not be liable for any indirect, special, incidental or consequential damages to the product that has been modified or altered.

Static Electricity Precautions

It is quite easy to inadvertently damage your PC, system board, components or devices even before installing them in your system unit. Static electrical discharge can damage computer components without causing any signs of physical damage. You must take extra care in handling them to ensure against electrostatic build-up.

1. To prevent electrostatic build-up, leave the system board in its anti-static bag until you are ready to install it.
2. Wear an antistatic wrist strap.
3. Do all preparation work on a static-free surface.
4. Hold the device only by its edges. Be careful not to touch any of the components, contacts or connections.
5. Avoid touching the pins or contacts on all modules and connectors. Hold modules or connectors by their ends.

Important:
Electrostatic discharge (ESD) can damage your processor, disk drive and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.

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Safety Measures

To avoid damage to the system:
• Use the correct AC input voltage range.

To reduce the risk of electric shock:
• Unplug the power cord before removing the system chassis cover for installation or servicing. After installation or servicing, cover the system chassis before plugging the power cord.

Battery:
• Danger of explosion if battery incorrectly replaced.
• Replace only with the same or equivalent type recommend by the manufacturer.
• Dispose of used batteries according to local ordinance.

Before Using the

Before using the system, prepare basic system components.

If the system comes as a barebone; that is, none of the key components, including processor, memory, and hard drive has been pre-installed as part of your purchase, you will need to at least ensure a compatible counterpart is located and installed.

You will also need a few external system peripherals intended for the use of the system, a common pool with at least a keyboard, a mouse, and a monitor is thus suggested.

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Chapter 1
General Information

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1.1   Main Feature

Micro-ATX System Board

BNX-M81 is a standard Micro-ATX motherboard featuring Intel® H81 PCH chipset supports Intel® Gen-4 Core™ processor and two Dual Channel DDR3 SO-DIMM slots up to 16GB DDR3 1066/1333/1600MHz SDRAM with Non-ECC support and integrated HD graphic controller.

- Intel® Gen-4 LGA1150 Haswell Processor
- Two DDR3 RAM Slots up to 16GB
- Two SATA Ports: 2* SATA 3.0
- Two Display Ports: VGA, DVI-D
- Ten Series Ports: 2* Edge RS-232/422/485, 8* RS-232 Headers
- Six USB 2.0 Ports: 6* Internal Ports
- Four USB 3.0 ports: 4* Edge Ports
- Two Realtek GbE LAN Ports
- 1* Full-sized miniPCIe Slot
- 1* Half-sized miniPCIe Slot
- 1* PCIe 3.0 X16 Slot
- 1* PCIe 2.0 X1 Slot
- 2* PCI Slots

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1.2   Specifications

Core Engine	Chipset	Intel® H81 PCH
	Processor	Support Intel® Gen-4 Core i3, i5, i7, Pentium®, Celeron® Processor Single LGA1150 Processor Socket
	Memory	2x DDR3 1066/1333 SO-DIMM Slots, up to 16GB, Non-ECC/Non-Buffered Memory Module
	Display	Intel® HD Graphics 4600
Ethernet	Controller	Onboard 2x Realtek RTL8111G GbE Controllers
Storage	SATA	2x SATA3 Ports
Expansion	PCIe X16	1x
	PCIe X1	1x
	PCI	2x
	miniPCIe	1x Full-sized + 1x Half-sized
Edge I/O	PS/2	2x PS/2 for Keyboard and Mouse
	COM	2x DB9 RS-232
	Display	1x DB15 VGA + 1x DVI-I
	USB	4x USB 3.0 Ports
	LAN	2x RJ45 GbE
	Audio	3x Audio Jacks
Internal I/O	Front Panel	1x Front Panel Switch/LED Header
	LPT	1x Parallel Box Header
	COM	8x RS-232 Pin Header
	USB	6x USB 2.0 Pin Headers
	Fan	3x Fan Connectors
Other	H/W Monitoring	Monitor temperature, voltage, and fan speed, auto-throttling control at CPU overheat
	WDT	1 min increment from 1 to 255 min, 1 sec increment from 1 to 255 sec
Environment	Operating Temp.	0ºC ~ 60ºC
	Storage Temp.	-20ºC ~ 70ºC
	Humidity	10% ~ 90% (Non-Condensing)
Mechanical	Dimension	244mm (W) x 244mm (D)

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1.3 Board Layout

Figure 1.1: Board Layout of BNX-M81

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Chapter 2
Preparation

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2.1   Before You Begin

A stable and clean working environment are essential. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.
Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:

- A Philips screwdriver
- A flat-tipped screwdriver
- A set of jewelers Screwdrivers
- A grounding strap
- An anti-static pad

Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nosed pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

Before working on internal components, make sure that the power is off. Ground yourself before touching any internal components, by touching a metal object. Static electricity can damage many of the electronic components. Humid environment tend to have less static electricity than dry environments. A grounding strap is warranted whenever danger of static electricity exists.

2.2   Precautions

Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on the computers that are still connected to a power supply can be extremely dangerous. Follow the guidelines below to avoid damage to your computer or yourself:

- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.
- Hold electronic circuit boards by the edges only. Never touch the components on the board unless it is necessary to do so. Do not flex or stress the circuit board.
- Leave all components inside the static-proof packaging that they shipped with until they are ready for installation.
- Use correct screws and do not over tighten screws.

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2.3   Setting Jumpers

A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is SHORT. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is OPEN. Please see the following illustrations

The illustrations on the right show a 2-pin jumper. When the jumper cap is placed on both pins, the jumper is **SHORT**. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is **OPEN**.	Open (Off)	Short (On)
These illustrations show a 3-pin jumper. Pins 1 and 2 are **SHORT**.		

Table 2-1: Setting Jumpers

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2.4   Back Panel Connectors

1. PS/2 Mouse (Green)
2. DB15 VGA
3. DB9 RS-232
4. LAN1
5. LAN2
6. Line-In Jack
7. Line-Out Jack
8. Microphone Jack
9. 2* USB 3.0
10. 2* USB 3.0
11. DB9 RS-232
12. DVI-I
13. PS/2 Keyboard (Purple)

2.5   Locations Of Jumpers and Connectors

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List of Onboard Connectors

1	AUDIO	Audio connectors
2	USB_LAN2	RJ45 LAN port (top) / USB 2.0 ports (buttom)
3	USB_LAN1	RJ45 LAN port (top) / USB 2.0 ports (buttom)
4	COM34	Serial ports
5	VGA_DVI	VGA port (top)/DVI port (buttom)
6	JCOM5 JRS23 JRS22 JRS27 JRS29	RS232/RS422/RS485 Select Jumper for COM4
7	COM5	Serial port cable connector #5
8	COM6	Serial port cable connector #6
9	JRS14 JRS15 JRS22 JRS19 JCOM3	RS232/RS422/RS485 Select Jumper for COM3
10	ATX_12V	4 pin power connector
11	COM8	Serial port cable connector #8
12	COM7	Serial port cable connector #7
13	JCOM6	COM6 Power Select jumper
14	COM9	Serial port cable connector #9
15	JCOM8	COM10 Power Select jumper
16	COM10	Serial port cable connector #10
17	CPU	Intel LGA 1155 socket
18	CPU_FAN	CPU fan connector
19	SODIMMA	DDR3 SO-DIMM slot
20	SODIMMB	DDR3 SO-DIMM slot
21	LPT	LPT connector
22	MIN_PCIE1	Mini PCi Express connector
23	MIN_PCIE2	Mini PCi Express connector
24	JRS9 LVDS	Enable Jumper
25	JRS10 LVDS	Enable Jumper
26	JRS8 LVDS	Enable Jumper
27	JRS7 LVDS	Enable Jumper

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28	LVDS	LVDS connector
29	BKL_CN	LCD Inverter Connector
30	JRS6	LVDS Enable Jumper
31	ATX	24 pin main power connector
32	SYS_FAN2	System fan connector #2
33	SATA1/SATA2	SATA 3Gb/s connectors
34	F_PANEL	Front Panel header
35	GPIO_CNT	GPIO connector
36	F_USB3	Front USB 2.0 header #3
37	F_USB2	Front USB 2.0 header #2
38	F_USB1	Front USB 2.0 header #1
39	BATTERY	Battery socket
40	LPC	LPC connector
41	CI	Case open intrusion header
42	CLR_CMOS	Clear CMOS jumper
43	COM1	Serial port cable connector #1
44	COM2	Serial port cable connector #2
45	F_AUDIO	Front audio header
46	SPK_OUT	Audio Amplifier connector
47	PCI2	PCI 32bit/33MHz slot
48	PCI1	PCI 32bit/33MHz slot
49	PCIE1X1	PCI Express x1 slot
50	PCIE16X1	PCI Express x16 slot
51	SYS_FAN	System fan connector

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2.6   Jumpers

▶ COM3 RS-232/422/485 Selection Jumper

JRS14/JRS15/JRS21/JRS19

	Pin	Definition
1 ▪▪▪	1-2 Closed	RS-422/485
1 ▪▪▪	2-3 Closed	RS-232

JCOM3

	Pin	Definition
2 1 6 5	1-2 Closed	RS-232
2 1 6 5	3-4 Closed	RS-422
2 1 6 5	5-6 Closed	RS-485

► COM5 RS-232/422/485 Selection Jumper

JRS23/JRS22/JRS27/JRS29

	Pin	Definition
1 ▭	1-2 Closed	RS-422/485
1 ▭	2-3 Closed	RS-232

JCOM5

	Pin	Definition
2 1 / 6 5	1-2 Closed	RS-232
2 1 / 6 5	3-4 Closed	RS-422
2 1 / 6 5	5-6 Closed	RS-485

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► **JCOM6 / JCOM8 Pin#9 (RI) Selection Jumper**

Pin	Definition
1-2 Closed	5V
3-4 Closed	RI
5-6 Closed	12V

► **JRS9 / JRS10 / JRS8 / JRS7 / JRS6 (LVDS Enable Jumper)**

JRS6

Pin	Definition
1-2 Closed	Enable LVDS
2-3 Closed	Disable LVDS

JRS7 / JRS8 / JRS9 / JRS10

Jumper	1024 x 600	1024 x 768
JRS7		
JRS8		
JRS9		
JRS10		

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► CLR_CMOS (Clear CMOS Jumper)

Pin		Definition
Open		Normal Operation
Close		Clear CMOS

2.7　Internal Connectors

24-pin ATX Power Connector / 4-pin 12V Power Connector

Pin	Definition
1	GND
2	GND
3	+12V
4	+12V

Pin	Definition	Pin	Definition
1	3.3V	13	3.3V
2	3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	Power OK	20	NA
9	5VSB (stand by +5V)	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	3.3V	24	GND

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SATA1/SATA2 Connector

Pin	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND
8	VCC
9	GND

4-pin CPU/System Fan Connector

Pin	Definition
1	GND
2	+12V
3	Sense
4	Speed Control

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USB1 / USB2 / USB3 Connector

Pin	Definition	Pin	Definition
1	5V	2	5V
3	D-	4	D-
5	D+	6	D+
7	GND	8	GND
9		10	NC

Serial Port Connector

Remark: Pin#9 (RI) of COM9/COM10 can be adjusted with 5V/12V output via Jumper.

Pin	Definition	Pin	Definition
1	RXD	2	DCD
3	DTR	4	TXD
5	DSR	6	GND
7	CTS	8	RTS
9	NC	10	RI

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F_Audio Connector (Front Panel Audio Header)

Pin	Definition	Pin	Definition
1	MIC_L	2	-AGND
3	MIC_R	4	-ACZ_DET
5	HPOUT_R	6	SRTN1
7	FAUDIO_JD	8	NC
9	HPOUT_L	10	SRTN2

SPK_OUT (Audio Amplifier Connector)

Pin	Definition
1	OUT_R+
2	OUT_R-
3	OUT_L-
4	OUT_L+

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GPIO_CNT (GPIO Connector)

Pin	Definition	Pin	Definition
1	GPIO1	2	GPIO68
3	GPIO6	4	GPIO69
5	GPIO7	6	GPIO70
7	GPIO17	8	GPIO71
9	SMBCLK	10	SMBDATA
11	VCC	12	GND

LPT Connector

Pin	Definition	Pin	Definition
1	STB-	16	GND
2	PD3	17	PD1
3	GND	18	PD7
4	GND	19	GND
5	AFD-	20	GND
6	PD4	21	INIT-
7	GND	22	ACK-
8	GND	23	GND
9	PD0	24	GND
10	PD5	25	PD2
11	GND	26	BUSY
12	GND	27	GND
13	ERR-	28	PE
14	PD6	29	SLIN-
15	GND	30	SLCT

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F_PANEL (Front Panel Connector)

Pin	Signal Name	Definition
1	HD+	Hard Disk LED Signal anode (+)
2	MPD+	Power LED Signal anode (+)
3	HD-	Hard Disk LED Signal cathode(-)
4	GND	Ground
5	GND	Ground
6	-PWRBT_F	Power Button cathode(-)
7	-SYS_RST	Reset Button
8	GND	Ground
9	NC	No connect
10	NC	No Pin

BLK_CN (LCD Inverter Connector)

Pin	Definition
1	VCC
2	PWM_OUT
3	ENABKL
4	GND
5	+12V

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LVDS (LVDS Header)

Pin	Signal Name	Pin	Signal Name
1	VCC3	21	A5P_C
2	VCC	22	A4P_C
3	VCC3	23	A5M_C
4	VCC	24	A4M_C
5	SPC0	25	GND
6	SPD0	26	GND
7	GND	27	A7P_C
8	GND	28	A6P_C
9	A1P_C	29	A7M_C
10	A0P_C	30	A6M_C
11	A1M_C	31	GND
12	A0M_C	32	GND
13	GND	33	CLK2P_C
14	GND	34	CLK1P_C
15	A3P_C	35	CLK2M_C
16	A2P_C	36	CLK1M_C
17	A3M_C	37	GND
18	A2M_C	38	GND
19	GND	39	+12V
20	GND	40	+12V

CI (Case Open Inverter Connector)

Pin		Definition
	Open	Normal Operation
	Close	Alert Active

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Chapter 3
Operation

3.1   System Memory

BNX-M81 has Intel® H81 chipset built-in, and supports dual channel non-ECC, un-buffered DDR3-1066/1333/1600MHz memory modules. Two SO-DIMM slots support up to 16GB Memory Capacity.

3.2   Installing Memory

To install Memory

1. Make sure the "Key" on Memory module and slot are perfectly matched, and add slowly the RAM module into the slot.
2. Push the RAM module right up until the module is snapped in the slot by both side clips.

3. To remove the Memory modules, please push the clips outwards, and the memory modules will be automatically disengaged.

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3.3 Installing LGA1150 Intel® Core-i CPU, Heatsink, and Fan

BNX-M81 supports Intel® LGA1150 Gen-4 Core-i Processor. For a reference list of supported processor, please refer to the specification section. The socket 1150 is formed up with sensitive arrays of pins, improper or careless installation may cause permanent harm to the socket pins. In some cases users may accidentally damage the socket simply by adjusting the position of the CPU.

Please follow the installation instructions as shown below:

Step (A): Opening the Socket

1. Push the "Socket Lever" down and away from the socket to release it.

2. Rotate the "Socket Lever" to lift the "Load Plate" away from the socket.

3. Make sure the "Load Plate" is in the fully open position, and also remove the socket cover.

4. When opening the socket, DO NOT TOUCH the gold socket contacts.

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Step (B): Install the Processor

1. Hold the processor with your thumb and index finger as shown to align your fingers with the socket cutouts.

2. Make sure that the processor Pin#1 indicator (gold triangle) is aligned with the Pin#1 chamfer on the socket.

3. Make sure that the notches on the processor align with the posts on the socket.

4. Lower the processor straight down without tilting or sliding it in the socket.

Step (C): Close the Load Plate

1. Carefully lower the "Load Plate" and make sure it slides under the shoulder screw cap as the lever is lowered.

2. Continue to low the lever.

3. Latch the socket lever under the load plate tab.

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Step (D): Install a Heatsink

Note: Heatsinks that come with boxed Intel® processors use pre-applied Thermal Interface Material (TIM) and do not need thermal grease. If a different heatsink is used, please refer to manufacturer's instructions.

1. Place the heatsink onto the processor socket. Ensure that the fan power cable is on the side closet to the processor fan header.

2. Align the fasteners with the corresponding board holes (four of them). Ensure that the fasteners slots are pointing perpendicular to the heatsink.

3. While pressing down on the heatsink, press down on the top of the fasteners with your thumb to lock into place. Ensure that all four fasteners are secured.

4. Connect the heatsink fan power cable to the processor fan header.

Typical heatsink shown, yours may differ.

Fastener (Correct Orientation)

Pre-applied TIM (underneath)

Processor Fan Header

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3.4   Adding Power Connectors

BNX-M81 motherboard requires correct power plan to properly support Intel® LGA1150 Gen-4 Core-i Processor. Please add the 24-pin ATX Power Connector on the blue connector, and 4-pin 12Vdc Power Connector on the red connector

In case the 12Vdc Power Connector is not added, power supply will be triggered, but the motherboard would not boot at all. Please shutdown the system, and add the 12Vdc Power Connector back on.

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3.5   Adding PCIe/PCI Cards

BNX-M81 motherboard comes with 2* PCIe Slots and 5* PCI Slots. Prior to add your expansion card onto these slots, please:

(1) Identify the type of expansion card to be added. In the picture below:

Color	Definition	Signal	Deployment
Blue	5* PCI Slots	PCI Signal	5V or Universal PCI
Yellow	1* PCIe X1 Slot	PCIe 2.0 X1 Signal	Good for PCIe X1
White	1* PCIe X16 Slot	PCIe 3.0 X16 Signal.	Good for all PCIe Cards

(2) Shutdown the system (would be nice to cut the power) if system is running.
(3) Plug in the cards and put the power back on.
(4) Please refer to the application notes of user's manual of the expansion card to load driver files or initiate the expansion cards.

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3.6 Install a PCI Express Mini Card in the Full-Mini Card Slot

The Full-Mini Card slot can only be used with a Full-sized PCI Express Mini Card.

Full-Mini Card Position

Half-Mini Card Position

PCI Express Full-Mini Card Installation:
- (A) If a screw is found in the stand-off, please remove the screw.
- (B) Align the notch in the card with the socket key and insert the card at a slightly upward angle as shown.
- (C) Push down on the card and secure with one screw.

Correct Locations

Socket Key
Notch

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Chapter 4
BIOS Setup

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About the BIOS

The BIOS (Basic Input and Output System) Setup program is a menu driven utility that enables you to make changes to the system configuration and tailor your system to suit your individual work needs. It is a ROM-based configuration utility that displays the system's configuration status and provides you with a tool to set system parameters. These parameters are stored in non-volatile battery-backed-up CMOS RAM that saves this information even when the power is turned off. When the system is turned back on, the system is configured with the values stored in CMOS.

With easy-to-use pull down menus, you can configure such items as:
- Hard drives, diskette drives, and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Power management features

When to Run BIOS

This program should be executed under the following conditions:
- When changing the system configurations.
- When a configuration error is detected by the system and you are prompted to make changes to the Setup program.
- When resetting the system clock.
- When setting the CPU clock speed so that it automatically runs either fast or slow.
- When redefining the communication ports to prevent any conflicts.
- When making changes to the Power Management configuration.
- When changing the password or making other changes to the security setup.

Normally, CMOS setup is needed when the system hardware is not consistent with the information contained in the CMOS RAM, whenever the CMOS RAM loses power, or when the system features need to be changed.

When to Update BIOS

In the event that new features are released and a BIOS update is required, you will need to update your BIOS on your own, with the help of an appropriate guide, a reference tool, and some command files for the job.

Please seek for help from your local dealer, or send your request to our technical support department.

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4.1   Entering Setup

When the system is powered on, the BIOS will initiate the Power-On-Self-Test (POST) routines. These routines perform various diagnostic checks. If an error is encountered, the error will be reported in one of two different ways:

- If the error occurs before the display device is initialized, a series of beeps will be transmitted.
- If the error occurs after the display device is initialized, the screen will display the error message.

Powering on the computer and immediately pressing <**Del**> allows you to enter Setup. Another way to enter Setup is to power on the computer and wait for the following message during the POST:

TO ENTER SETUP BEFORE BOOT
PRESS <CTRL-ALT-ESC> OR <DEL> KEY

Press the <**Del**> key or press the <**Ctrl**>, <**Alt**>, and <**Esc**> keys to enter Setup.

4.2   Getting Help

The online description of the highlighted setup item is displayed at the right pane of the menu at all time. Press F1 to pop up a small help window that lists all the function keys and its use.

To exit the Help Window, press **<F1>** or **<Esc>.**

4.3   Control Keys

The table below lists all the function keys for the navigation in the BIOS setup menu.

Function Key	Description
Up/Down Arrow Key	Move Up/Down
Left/Right Arrow Key	Move Left/Right
Enter Key	Select
+/- Key	Change value
ESC	Exit
F1	General Help
F2	Previous Values
F9	Optimized Defaults
F10	Save & Exit BIOS Setup Menu

To exit the Help Window, press **<F1>** or **<Esc>.**

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4.4 The Main Menu

The menu bar on the top of the first screen has the following submenus:

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

  BIOS Information                                          Set the Date. Use Tab to
  BIOS Vendor                   American Megatrends         switch between Date elements.
  Core Version                  4.6.5.4
  Compliancy                    UEFI 2.3.1; PI 1.2
  Project Version               M81.D5b x64
  Build Date and Time           03/06/2014 15:42:08

  IGFX VBIOS Version            2178
  Memory Information
  Total Memory                  4096 MB (DDR3)
  Memory Frequency              1600 Mhz

  System Date                   [Thu 03/06/2014]
  System Time                   [15:53:53]                  →←: Select Screen
                                                            ↑↓: Select Item
  Access Level                  Administrator               Enter: Select
                                                            +/-: Change Opt.
                                                            F1: General Help
                                                            F2: Previous Values
                                                            F9: Optimized Defaults
                                                            F10: Save & Exit
                                                            ESC: Exit



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```

➢ **Main:** Basic system configuration.

➢ **Advanced:** Advanced system settings.

➢ **Chipset:** Chipset settings

➢ **Boot:** System boot configuration.

➢ **Security:** BIOS security settings.

➢ **Save & Exit:** Exit options as well as loading optimal defaults

System Date [Day xx/xx/xxxx]: Set the system date.
System Time [xx:xx:xx]: Set the system time.

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4.5 The Advanced Menu

```
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     Main  Advanced  Chipset  Boot  Security  Save & Exit

     Wake On Lan from S5               [Enabled]          Enabled/Disabled GbE control
   ▶ ACPI Settings                                        PME in S5.
   ▶ S5 RTC Wake Settings
   ▶ Trusted Computing
   ▶ CPU Configuration
   ▶ SATA Configuration
   ▶ USB Configuration
   ▶ H/W Monitor
   ▶ Super IO Configuration (COM 1/2, LPT)
   ▶ F81216 Second Super IO Configuration (COM 3/4/5/6)
   ▶ F81216 Third Super IO Configuration (COM 7/8/9/10)
   ▶ Intel(R) Smart Connect Technology
   ▶ Network Stack
                                                          ──────────────────────────
                                                          →←: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
                                                          +/-: Change Opt.
                                                          F1: General Help
                                                          F2: Previous Values
                                                          F9: Optimized Defaults
                                                          F10: Save & Exit
                                                          ESC: Exit


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```

Wake On Lan from S5

Enable/Disable Wake-On-LAN from S5

Options: Enabled/Disabled. Default setting is **Enabled**.

ACPI Settings

ACPI Sleep State

Select the ACPI sleep state which the system will move forward when the suspend button is pressed.

Options: Suspend Disabled/S1 only (CPU Stop Clock)/S3 only (Suspend to RAM). Default setting is **S3 only (Suspend to RAM)**.

S5 RTC Wake Settings

Wake System with Fixed Time [Disabled]

Enabled to wake up system at the specified hr::min::sec alarm event.

Wake up day/hour/minute/second

Specify the values for day/hour/minute/second.

*This setting is available only when **Wake System with Fixed Time** is enabled.

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Security Device Support

Enabled to wake up system at the specified hr::min::sec alarm event.

Enable/Disable BIOS support for security device.

Options: Enabled/Disabled. Default setting is **Disabled**.

CPU Configuration

Active Processor Cores

Select the number of CPU cores to be enabled.

Options: All/1/2/3. Default setting is **All**.

Execute Disable Bit

Enable/Disable the protection against buffer overflow attacks

Options: Enabled/Disabled. Default setting is **Enabled**.

Intel Virtualization Technology

Enabl/Disable Intel Virtualization Technology function.

Options: Enabled/Disabled. Default setting is **Enabled**.

EIST (Enhanced Intel SpeedStep Technology)

Enable/Disable Intel® SpeedStep Technology

Options: Enabled/Disabled. Default setting is **Enabled**.

Turbo Mode

Enable/Disable CPU overclock the speed of CPU cores.

Options: Enabled/Disabled. Default setting is **Enabled**.

SATA Configuration

SATA Mode Selection

Select the on chip SATA type.

Options: IDE/AHCI. Default setting is **AHCI**.

Serial ATA Port 1/Serial ATA Port 2/Serial ATA Port mSATA

Devices detected in each SATA port, including mSATA, will be shown up here.

USB Configuration

Legacy USB Support

Enable/Disable the support for legacy USB devices.

Option: Auto/Enabled/Disabled. Default setting is **Enabled**.

USB3.0 Support

Enable/Disable USB3.0 (XHCI) controller support.

Options: Enabled/Disabled. Default setting is **Enabled**.

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XHCI Hand-off

Enable/Disable XHCI (USB 3.0) Hand-off support.

Option: Enabled/Disabled. Default setting is **Enabled**.

EHCI Hand-off

Enable/Disable EHCI (USB 2.0) Hand-off function.

Option: Enabled/Disabled. Default setting is **Disabled**.

Mass Storage Device

Determine the working type of USB flash drive, as Floppy Drive or Hard Drive.

Options: Auto.

H/W Monitor

CPU/System FAN/System FAN 2 Fail Detect

Enable/Disable CPU (System) Fan Fail detection.

Options: Enabled/Disabled.

Default setting for CPU FAN is **Enabled**.

Default setting for System FAN and System FAN2 are **Enabled**.

CPU/System/System 2 SMART FAN Control

Enable/Disable CPU (System) Smart Fan function.

Options: Enabled/Disabled. Default setting is **Enabled**.

Super I/O Configuration (COM 1/2, LPT)

Serial Port 1/Serial Port 2

Enabled to configure the serial port settings. No setting would be available if disabled.

Options: Enabled/Disabled. Default setting is **Enabled**.

Parallel Port

Enabled to configure the parallel port setting.

Options: Enabled/Disabled. Default setting is **Enabled**.

Change Settings

Change Parallel port device settings. When set to Auto, it is either BIOS or OS to select a configuration.

Options: Auto, IO=378h/IRQ=5, IO=378h/IRQ=5,6,7,9,110,11,12, IO=278h/IRQ=5,6,7,9,110,11,12,

IO=3BCh/IRQ=5,6,7,9,110,11,12

Default setting is **Auto**.

Device Mode

Configure the device mode for parallel port.

Option: Standard Parallel Port Mode/EPP Mode/ECP Mode/EPP Mode & ECP Mode.

Default setting is **Standard Parallel Port Mode**.

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F81216 Second Super I/O Configuration (COM 3/4/5/6)

Serial Port 3/Serial Port 4/Serial Port 5/Serial Port 6

Enabled to configure the serial port settings. No setting would be available if disabled.

Options: Enabled/Disabled. Default setting is **Enabled**.

F81216 Third Super I/O Configuration (COM 7/8/9/10)

Serial Port 7/Serial Port 8/Serial Port 9/Serial Port 10

Enabled to configure the serial port settings. No setting would be available if disabled.

Options: Enabled/Disabled. Default setting is **Enabled**.

Intel® Smart Connect Technology

ISCT Support

Enable/Disable Intel® Smart Connect Technology (ISCT) function.

Option: Enabled/Disabled. Default setting is **Enabled**.

ISCT Notification Control

Enable/Disable ISCT Notification Control function.

Options: Enabled/Disabled. Default setting is **Enabled**.

ISCT WLAN Power Control

Enable/Disable ISCT WLAN Power Control function.

Options: Enabled/Disabled. Default setting is **Enabled**.

ISCT WWAN Power Control

Enable/Disable ISCT WWAN Power Control function.

Options: Enabled/Disabled. Default setting is **Enabled**.

ISCT RF Kill Switch Type

Software/Hardware ISCT RF Kill Switch Type.

Options: Software/Hardware. Default setting is **Software**.

Network Stack

Network stack

Enable/Disable UEFI network stack.

Options: Enabled/DIsabled. Default setting is **Disabled**.

Ipv4 PXE Support

Enable/Disable Ipv4 PXE Support.

Options: Enabled/DIsabled. Default setting is **Disabled**.

Ipv6 PXE Support

Enable/Disable Ipv6 PXE Support.

Options: Enabled/DIsabled. Default setting is **Disabled**.

4.6 The Chipset Menu

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

    Restore AC Power Loss          [Power Off]              Select AC power state when
    Azalia HD Audio                [Enabled]                power is re-applied after a
    Onboard LAN1                   [Enabled]                power failure.
      LAN PXE ROM                  [Disabled]
      LAN MAC Address1             74-D4-35-1D-18-5A

    Onboard LAN2                   [Enabled]
      LAN PXE ROM                  [Disabled]
      LAN MAC Address2             74-D4-35-1D-18-5B
    ERP (DeepSx Power Policies)    [Enabled in S5]
    Wake on Ring                   [Enabled]
    VT-d                           [Enabled]
    Initate Graphic Adapter        [PEG/IGD]                →←: Select Screen
    Primary IGFX Boot Display      [VBIOS Default]          ↑↓: Select Item
    DVMT Total Gfx Mem             [256M]                   Enter: Select
                                                            +/-: Change Opt.
                                                            F1: General Help
                                                            F2: Previous Values
                                                            F9: Optimized Defaults
                                                            F10: Save & Exit
                                                            ESC: Exit


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```

Restore AC Power Loss

Set the operating state after system is recovered from AC power loss.

[Power On] ON State

[Power Off] OFF State

[Last Status] Last State at which system is maintained before the AC power loss

Options: Power On/Power Off/Last State. Default setting is **Power Off**.

Azalia HD Audio

Enable/Disable onboard audio controller.

Options: Auto/Enabled/Disabled. Default setting is **Enabled**.

Onboard LAN1/2

Enable/Disable onboard LAN 1/2 controller.

Options: Enabled/Disabled. Default setting is **Enabled**.

LAN1/2 PXE ROM

Enable/Disable LAN1/2 PXE ROM.

Options: Enabled/Disabled. Default setting is **Disabled**.

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ERP (DeepSx Power Policies)

Enable/Disable ERP function.

Options available: Enabled/Disabled. Default setting is **Disabled**.

Wake On Ring

Enable/Disable Wake On Ring function.

Options: Enabled/Disabled. Default setting is **Enabled**.

VT-d

Enable/Disable Intel® Virtualization Technology for Directed I/O (VT-d) feature.

Options: Enabled/Disabled. Default setting is **Enabled**.

Initate Graphic Adapter

Configure the primary display device.

Options: IGD/PEG/IGD. Default setting is **PEG/IGD**.

Primary IGFX Boot Display

Select the Video device which will be activated during POST.

Options: VBIOS Default/CRT/DVI/LVDS. Default setting is **VBIOS Default**.

DVMT Total Gfx Mem

Options: 128MB/256MB/MAX. Default setting is **256MB**.

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4.7   The Boot Menu

```
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         Main  Advanced  Chipset  Boot  Security  Save & Exit

        Boot Configuration                                        Select the keyboard NumLock
        Bootup NumLock State              [On]                    state

        Screen LOGO Show                  [Enabled]
        Fast Boot                         [Disabled]

        Boot Mode                         [CSM Boot]

        Boot Option Priorities
        Boot Option #1                    [TDKMediaTrans-It Dr...]
        Boot Option #2                    [UEFI: TDKMediaTrans...]

        Hard Drive BBS Priorities                                 →←: Select Screen
        CSM parameters                                            ↑↓: Select Item
                                                                  Enter: Select
                                                                  +/-: Change Opt.
                                                                  F1: General Help
                                                                  F2: Previous Values
                                                                  F9: Optimized Defaults
                                                                  F10: Save & Exit
                                                                  ESC: Exit

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```

Bootup NumLock State

Enable or Disable Bootup NumLock function.

Options: On/Off. Default setting is **On**.

Screen Logo Show

Enable/Disable showing Screen Logo during system boot.

Options: Enabled/Disabled. Default setting is **Enabled**.

Fast Boot

Enabled to speed up the boot time by skipping a few boot procedures

Options: Enabled/Disabled. Default setting is **Disabled**.

Boot Mode

Configure the boot mode.

UEFI Boot: Support to boot any UEFI-capable OS.

CSM Boot: Support to boot non UEFI-capable OS that expects a legacy BIOS interface.

Options: CSM Support/UEFI Boot. Default setting is **CSM Boot**.

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Boot Option #1/#2

Press Enter to configure the boot priority.

By default, the server searches for boot devices in the following sequence: UEFI device, Hard drive.

CSM parameters

Press Enter to configure the advanced items.

Launch CSM (Compatibility Support Module)

Enable/Disable Compatibility Support Module (CSM) launch.

Options: Enabled/Disabled. Default setting is **Enabled**.

Boot option filter

Determines which devices system will boot at.

Options: UEFI and Legacy/Legacy only/UEFI only. Default setting is **UEFI and Legacy**.

Launch Storage OpROM policy

Determines which devices system will boot at.

Options: Do not launch/UEFI only/Legacy only/Legacy first/UEFI first.

Default setting is **Legacy only.**

Other PCI device ROM priority

For PCI devices other than Network, Mass storage, or Video device, defines which OpROM to launch.

Options: UEFI OpROM/Legacy OpROM. Default setting is **UEFI OpROM.**

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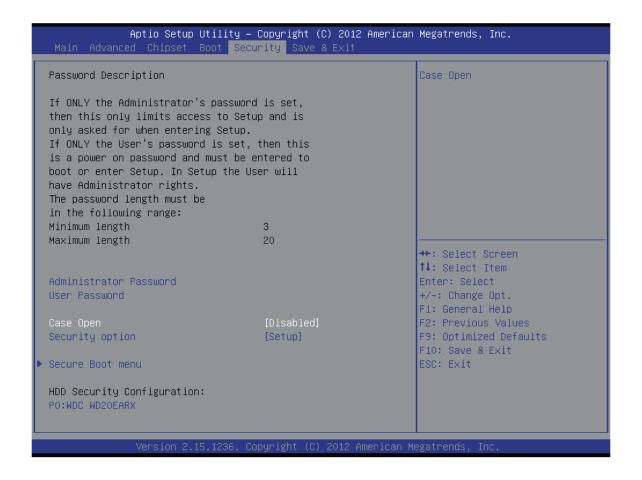TEL: +886-3-324-9700 | FAX: +886-3-324-9777 | EMAIL: sales@bestek-tp.com.tw

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4.8   The Security Menu

```
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    Main   Advanced   Chipset   Boot   Security   Save & Exit

    Password Description                                    Case Open

    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
                                                    ++: Select Screen
                                                    ↑↓: Select Item
    Administrator Password                          Enter: Select
    User Password                                   +/-: Change Opt.
                                                    F1: General Help
    Case Open                    [Disabled]         F2: Previous Values
    Security option              [Setup]            F9: Optimized Defaults
                                                    F10: Save & Exit
    ▶ Secure Boot menu                              ESC: Exit

    HDD Security Configuration:
    P0:WDC WD20EARX

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```

Administrator Password

Press Enter to configure the Administrator password.

User Password

Press Enter to configure the user password.

Case Open

Configure case open intrusion alert.

Options: Enabled/Disabled/Reset. Default setting is **Disabled**.

Security option

Select the security level.

Options: Setup/System. Default setting is **Setup**.

Secure Boot menu

Press Enter to configure the advanced items.

Secure Boot Support

Secure Boot requires all the applications that are running during the booting process to be pre-signed with valid digital certificates. This way, the system knows no tamper is operated upon all the files what are loaded before Windows 8 booting moves along to the login screen.

Options: Enabled/Disabled. Default setting is **Enabled**.

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Secure Boot Mode

Define the Secure Boot Mode. Set this item to **Custom** to enable the advanced items configuration.
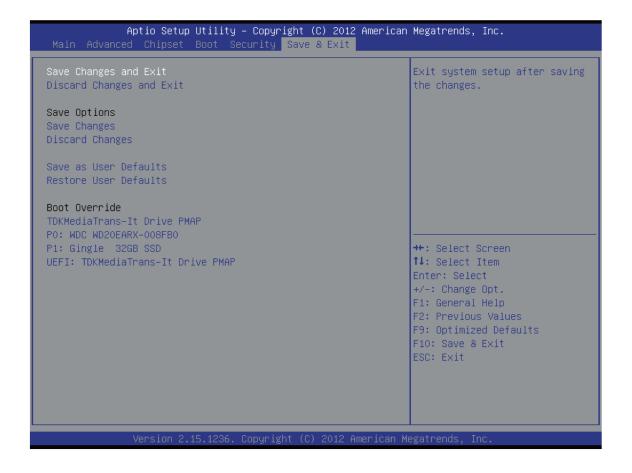
Option: Standard/Custom. Default setting is **Standard**.

Key Management

Press Enter to configure the advanced items.

4.9 The Save and Exit Menu

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

     Save Changes and Exit                                    Exit system setup after saving
     Discard Changes and Exit                                 the changes.

     Save Options
     Save Changes
     Discard Changes

     Save as User Defaults
     Restore User Defaults

     Boot Override
     TDKMediaTrans-It Drive PMAP
     P0: WDC WD20EARX-008FB0
     P1: Gingle  32GB SSD                                     →←: Select Screen
     UEFI: TDKMediaTrans-It Drive PMAP                        ↑↓: Select Item
                                                              Enter: Select
                                                              +/-: Change Opt.
                                                              F1: General Help
                                                              F2: Previous Values
                                                              F9: Optimized Defaults
                                                              F10: Save & Exit
                                                              ESC: Exit

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```

Save Changes and Exit

Saves changes made and close the BIOS setup.

Options: Yes/No.

Discard Changes and Exit

Discards changes made and close the BIOS setup.

Options: Yes/No.

Save Changes

Saves changes made in the BIOS setup.

Options: Yes/No.

Discard Changes

Discards changes made and close the BIOS setup.

Save as User Defaults

Press <Enter> on this item and then press the <Y> key to save as user default settings.

Options: Yes/No.

Restore User Defaults

Press <Enter> on this item and then press the <Y> key to restore user default settings.

Boot Override

Press Enter to configure the device as the boot-up drive.

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