

Braswell POS Motherboard

(with BIOS Setup)

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With kind regards,

Your opinion:

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Braswell POS Motherboard

User Manual

Edition May 2018

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1 Overview

1.1 Introduction

This specification describes the features of a motherboard based on the INTEL Braswell processor (SoC) in mITX form factor (O Series: O1.0-BSW-mITX 01750297809).

This O Series Motherboard is designed for Diebold Nixdorf's BEETLE /MIII, BEETLE /X plus and BEETLE moPOS PDH systems.

This mainboard will be produced only as one assembling variant: "N3160".

1.2 Highlights of O1.0-BSW-mITX Motherboard

- Intel Celeron processor N3160 (quad core), base 1.6GHz, up to 2.24GHz
- Integrated Intel HD Graphics 400
- 1x VGA (needs internal cable)
- 2x DVI (PL2)
- HDD SATA III interface (1 port)
- Fan-less motherboard design, but supports PSU (3 pin) and chassis fan (4 pin, with automatic PWM speed control)
- 1 Gigabit LAN
- 1 DDR3L SDRAM (SO-DIMM) socket, up to 8GB / 1600MHz supported
- 1 PCIe slot
- M.2 slot, connected by SATA
- 6 COM port pin header (all ports have the option to be powered COM)
- 1 LPT port pin header

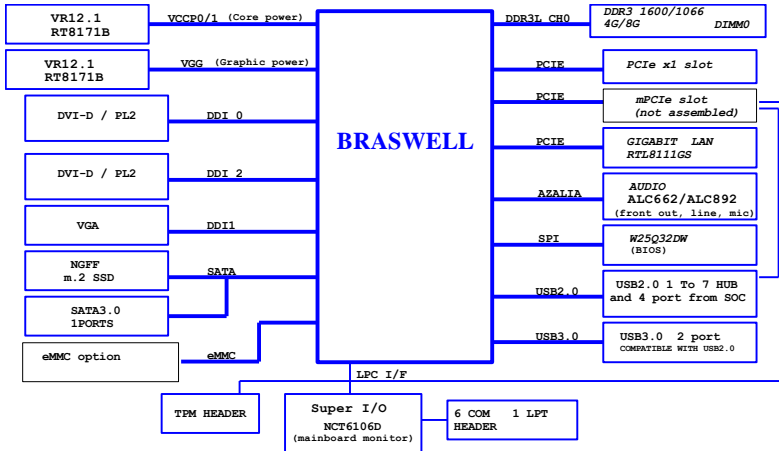
- 1 PS/2 port
- 9 USB2 ports
- 2 USB3 ports
- 1 cash drawer port onboard
- Intel HD audio controller with microphone, line in and line out
- OS support Windows 7 (32 and 64 Bit), Windows 10 (64 Bit)
- Long term availability for 5 years (Intel embedded roadmap)

1.3 Restriction of the O1.0 motherboard

- No support for Game Port, FDD
- No support for DOS and Win98 and XP
- No audio amplifier onboard
- no raid support
- no AMT support
- no support for displays without DDC

2 Motherboard Specification

2.1 Function blocks of O1.0 motherboard



2.2 Technical Specification and Motherboard Features summary

Microprocessor	Intel Celeron Processor N3160 (quad core), 1.6GHz
Supported Systems	BEETLE /MIII, /X plus and BEETLE moPOS PDH
Architecture	mITX form factor
Chipset	Braswell SoC, supporting SATA III controller, USB UHCI, EHCI and XHCI controller, Interrupt controller, DMA controller, LPC interface, RTC, SMBUS host interface, PCIe, Intel High Definition Audio interface, SPI
Super I/O	NCT6106D, supporting 6 UARTS, PS/2 Keyboard and Mouse interface, LPT, automatic fan speed controller, hardware monitor
Ethernet Controller	PCI-e based Realtek RTL8111G 10/100/1000 MBit, PXE
Wake On Feature	Wake On LAN, Wake On Time, Wake On USB, Wake On Keyboard (PS/2), Wake on Power Button
Sound Controller	Audio Codec with Line-out, Line-in and Mic-in connectors in I/O shield
Cash Drawer	onboard Cash Drawer controller, 6 pin JST connector for direct connection to cash drawer integrated in power supply
Main Memory	1x SO-DIMM, up to 8GB DDR3L SDRAM technology, based on up to 8Gb technology, unbuffered non-ECC running at 1600MHz
BIOS	SPI Flash, 64Mb, AMI BIOS, with customization for BEETLE Systems, PnP 1.1, ACPI, DMI-support
Keyboard	PS/2 connection onboard in I/O shield, supporting Y-cable for Mouse support

Serial Interfaces	COM1-6 onboard, pin header, powered COM support
LPT	onboard, pin header, supporting SPP, EPP, ECP
USB	<p>USB2.0, 6 ports:</p> <p>USB 1, 2 – 2 ports stacked connector, series A in I/O shield (together with PS/2),</p> <p>USB 3, 4 (USB1_FRONT) – internal 2x5 pin header (for front USB, green)</p> <p>USB 5, 6 (USB2_HUB, USB3_UPS) – internal 2x5 pin header (uplink for powered USB HUB and UPS)</p> <p>USB 7, 8 – used in conjunction with Panellink Interface</p> <p>USB 9 (USB4_PSU) – 24V powered USB in PSU</p> <p>USB3.0, 2 ports stacked connector, series A in I/O shield (together with LAN)</p>
Status LEDs	supports LED (ON, Standby, OFF, HDD), power button and buzzer (front panel connector)
mass storage	1 SATA III interface (3.0Gb/s), 1x M.2 interface (2280, key M, SATA only)
PCIe slot	1 slot PCIe x1, 2.0
Video out	2x DVI and Panellink 2.0, 1x VGA
Battery	for RTC and Super-I/O, Type: CR2032, 220mAh
Fuses	Poly switches or similar protection devices for powered COM, all external USB (2 ports sharing one fuse), PS/2, VGA, DVI, Panellink2,
I/O shield connectors	stacked USB and PS/2 Keyboard + Mouse, stacked USB3 and GigaBit LAN, DVI (Panellink2), audio (MIC In, LINE in, Line-Out)

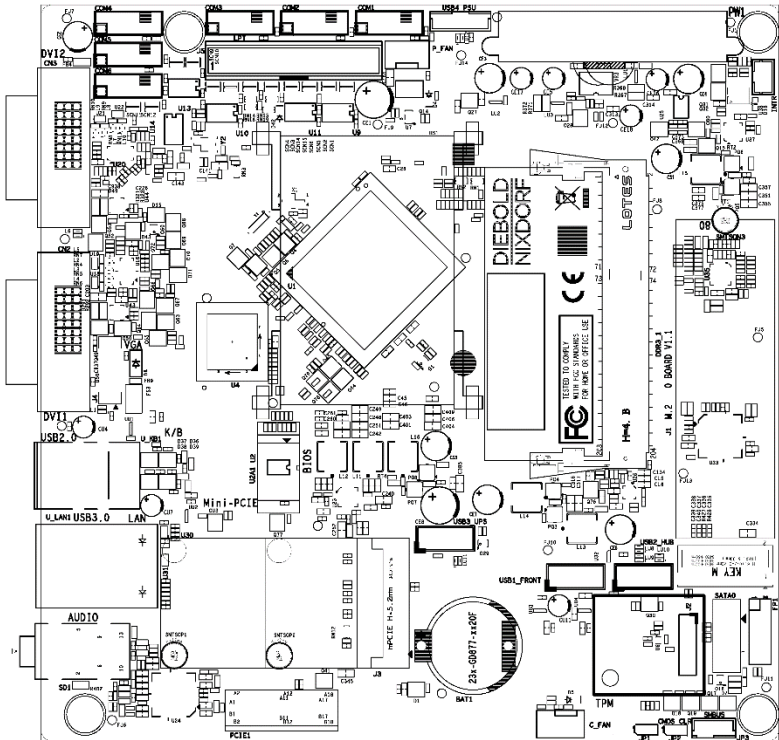
Internal connectors

1x DDR3 SO-DIMM socket, 1x Internal SATA connector, 1x USB (2 ports each, green color), 2x USB (1 port each), 6x (powered) COM, 1x CPU fan, 1x PSU fan, front panel, cash drawer, intrusion detection, TPM, VGA, M.2, CMOS clear, password clear

Board Dimension

170.0mm x 170.0 mm

2.3 Motherboard Mechanical Arrangement

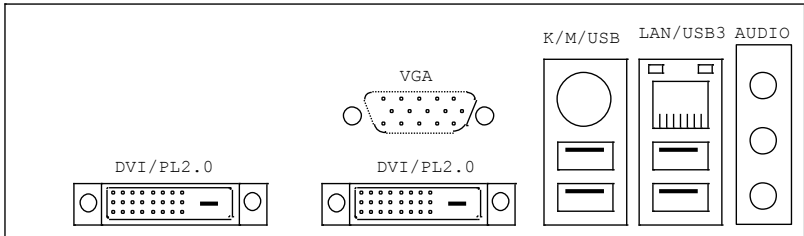


2.4 Motherboard PCB Dimension

O1.0 motherboard follows mITX standard and therefore PCB mechanical dimension is 170mm by 170mm.

2.5 External I/O Connector

External I/O connector arrangement:



Interface	Connector-Type
Keyboard, Mouse, USB	6 pin Mini Din + stacked dual USB2 series A
LAN, USB	RJ45 Ethernet + stacked dual USB3 series A
DVI/PanelLink2	DVI-I
AUDIO	3,5 mm female
VGA	Optional by cable, DSUB 15

2.6 Internal I/O Connector

Interface	Connector-Type
DDR3 SODIMM	1pcs 204 pin micro edge connector
M.2	1x M.2 2280 connector, Key M
Hard disk (SATA)	1pcs 7 pin Standard SATA headers
Power supply	ATX 20 pin power connector
USB1_FRONT	1pcs 2x5 pin headers, 2.54 mm, green
USB2_HUB, USB3_UPS	1pcs 2x5 pin headers, 2.54 mm, black
COM 1-6	6pcs 2x6 pin headers, 2.54mm
PSU FAN	1pcs 3 pin
CPU FAN	1pcs 4 pin
PCIe	1x standard PCIe x1 connector
TPM	2x7pin header, 2mm
Front panel	1pcs 2x6 pin header, 2.54mm
Chassis intrusion	1pcs 3 pins header (2.0mm shrouded)
Cash drawer (incl. 24V pUSB)	1pcs 6 pins header (2.0mm shrouded)

2.7 Jumper setting

Jumper	Connector-Type	Setting
JP1	Password clear	1-2 password clear
JP2	CMOS clear	1-2 CMOS clear

2.8 Power consumption of Braswell O1.0 Motherboard

O1.0 motherboard is powered by 3.3V, 5V, 5Vstby, 12V and -12V from a standard ATX power supply. The maximum current is specified as follows, this does not include external connected peripherals.

Voltage	I max	P
3.3V	0.45A	1.5W
5V	0.5A	2.5W
5VSB	1A	5W
12V	1.5A	18W
-12V	0.2A	2.4W

2.9 Maximum current rating for external peripherals

Interface	Voltage	I max
Powered COM (COM 1-6 summary)	5V	1A
Powered COM single port	5V	0.3A
Powered COM (COM 1-6 summary)	12V	1A
Powered COM single port	12V	0.6A
USB2, single port	5V	0.5A
USB3, single port	5V	0.9A
USB, all ports summary	5V	3A
Keyboard	5V	0.5A
VGA	5V	0.1A

2.9.1 Supported power modes (Sx)

O1.0 Motherboard supports power states S0, S3, S4 and S5. Wake up events from sleep states are supported from USB ports, internal CMOS clock, PS2 Keyboard, power button and Ethernet.

Power management supports ACPI 3.0 and APM1.2

Following power-on events from S4 and S5 are defined (if enabled in BIOS):

- Power button
- LAN
- RMT via Panellink2 interface
- Internal clock

2.10 Thermal management

O1.0 Motherboard supports 1 PSU FAN connector (3 pin) and 1 CPU 4 pin fan type.

Supported CPUs and its TDP and maximum junction temperature are:

CPU	TDP	Idle power	Max Tj
N3160	6W	2W typ.	90°C

2.11 CPU support

The CPU comes in a BGA package and is soldered to PCB and cannot be changed.

Processor	Core	Clock Speed	Footprint	Max TDP
N3160	4	1.6GHz	FCBGA15(1170)	6W

2.12 Memory support

The motherboard has one SO-DIMM socket supporting single channel, unbuffered, no ECC DDR3L SDRAM. Memory size of 1GB, 2GB, 4GB and 8GB.

DIMM Capacity	DRAM DEVICE TECHNOLOGY	DRAM ORGANIZATION
1 GB	1 Gb	X8
2 GB	2 Gb	X8
4 GB	4 Gb	X8
8 GB	8 Gb	X8
1 GB	2 Gb	X16
2 GB	4 Gb	X16
4 GB	8 Gb	X16

The motherboard supports the following memory features:

- 1066 / 1600 MHz unbuffered SDRAM SO-DIMM
- Non-ECC
- 1.35V voltage rating (DDR3L)
- BIOS automatically detects memory type, size, and speed

If 1333MHz memory modules are used, the frequency will be limited to 1066MHz automatically.

2.13 Graphics Subsystem

Graphic support of internal graphics accelerator of the N3160 processor to provide 3 independent displays.

Main features of integrated GPU are:

- Gen 8-LP Intel® graphics core, HD Graphics 400
- 320Mhz render clock, up to 640Mhz during burst, 12 execution units
- DirectX12, OpenGL 4.2
- Intel® Clear Video HD Technology
- Intel® Quick Sync Video
- Intel® InTru™ 3D Technology

The analogue VGA port, based on IT6515 eDP to VGA bridge, capable of driving a standard progressive scan monitor resolution up to 1920x1200@60Hz

SIGNAL	VOLTAGE LEVEL
R,G,B	0.7VP-P @75OHM
HSYNC, VSYNC	5.0V
DDC CHANNEL	OPEN DRAIN, 5.0V TOLERANT

2.14 Gigabit Ethernet LAN Interface

Gigabit Ethernet LAN interface is provided thru a PCI-e based Ethernet Controller made by Realtek RTL8111G.

2.15 Super I/O Controller

Super I/O controller NCT6106D from Nuvoton provides the following functions:

- 6 16C550 UARTs
- PS/2 Keyboard and Mouse controller
- Two Automatic Fan Speed controller
- Two tachometer inputs
- Hardware monitor
- The hardware monitor uses the following resistor dividers for
- 12V: 110k/10k (factor 12)
- 5V: 40.2k/10k (factor 5)

2.16 SATA III Interface

The CPU has two integrated SATA ports that support data transfer rates up to 6.0Gb/s.

SATA Port	USAGE ON MOTHERBOARD
Port #0	ON-BOARD CONNECTOR
Port #1	M.2

2.17 CPU Fan and System Fans

O1.0 motherboard supports automatic fan speed control by pulse width modulation (PWM) and by DC control.

If a 3 pin fan (DC control) is used in BEETLE/MIII as PSU fan with no rpm control and read-back.

The 2nd CPU fan (4 pin, PWM control) can be used in BEETLE moPOS PDH.

2.18 Audio

An INTEL HD Audio Link is provided by the Braswell N3160 SoC. It is used with a Realtek HD Audio Codec ALC662 providing a low cost solution. In case of EOL the ALC892 is prepared for AVL use.

Supported interfaces are:

- Line-out
- Mic-in
- Line-in

2.19 USB Interface

The Braswell SoC N3160 contains one XHCI compliant host controller that supports USB super-, high-, full- and low-speed signalling.

XHCI Port	Connection on Motherboard
0	Upper USB/LAN connector in IO shield
1	Lower USB/LAN connector in IO shield
2	Uplink to onboard USB hub chip
3	Upper USB/PS2 connector in IO shield
4	Lower USB/PS2 connector in IO shield
Hub port 0	Uplink to powered USB hub
Hub port 1	USB3_UPS connector
Hub port 2	PanelLink 1
Hub port 3	PanelLink 2
Hub port 4	Front USB (upper) (USB1_FRONT)
Hub port 5	Front USB (lower) (USB1_FRONT)
Hub port 6	24V powered USB port in PSU (USB4_PSU)

2.20 Serial Interfaces COM1-6

O1.0 motherboard provides six serial ports. All ports are routed to pin headers ready to be used as powered (female, incl. 5V and 12V, max current for powered COM: single port 300mA@5V; all ports together not more than 1A@5V; single port 600mA@12V; all ports together not more than 1A@12V) or standard COM (male). This selection is done by using different internal cables.

In case of powered serial ports (COM*) the signals RI and DCD are exchanged with system voltage of +5V and +12V. These serial ports are routed to 2x6 pin headers (2.54mm) and via cables to DSUB-9 connectors. All serial ports comply with RS-232 signalling level voltage.

Maximum voltage drop on 12V is 300mV, on 5V it is 150mV at full load. This output is designed according to UL regulations and is protected by a self-resettable fuse.

2.21 Parallel Port

O1.0 motherboard supports a parallel port according to IEEE1284.

2.22 PS/2 Keyboard Interface

The keyboard controller is part of the Super I/O chip. The PS/2 keyboard interface is available on a Mini DIN connector.

2.23 Front Panel Interface

The motherboard provides a front panel interface, supporting the following features:

- Power ON/OFF button
- Reset button
- Status LED, showing Active (Green, S0), Standby (Green, flashing, S3), Shutdown (orange, S4 and S5, HDD Activity (Amber, flashing)
- System beeper

2.24 Cash Drawer Interface

2.24.1 Cash Drawer Interface (SM bus)

This Cash Drawer interface is provided by a 6pin shrouded header. From this header a cable goes to the power supply where the cash drawer output is located.

The cash drawer function is equivalent to Diebold Nixdorf iPOS+ Braswell. It is based on NCT5605Y SM bus to GPIO bridge chip.

GP20 is used as CD output (a falling edge initiate a 250ms active cash drawer signal) while GP21 is used as status input.

2.25 Intrusion Detect Interface

O1.0 motherboard supports an intrusion detect interface connected to the Super IO.

The intrusion monitoring is used to protect the system against unauthorized opening of the chassis. This intrusion is detected even if no AC is applied. However, this will not be indicated until the system is operating again.

Type: 3 pin shrouded header, B3B-PH-K-S (JST) or equivalent.

2.26 TPM

O1.0 motherboard is prepared for Infineon TPM module. This feature is provided by a dual row 14 pin header pitch 2mm.

2.27 M.2

The M.2 connector supports M.2 Key M modules with SATA of 2280. M.2 PCIe based modules are not supported.

3 Connector and Pin Assignments

3.1 External Connectors

3.1.1 PS/2 Keyboard Connector

Type: Mini-DIN Female

Pin Number	Function
1	KB Data
2	GND
3	+5V
4	KB Clock
5	MS Data
6	MS Clock

3.1.2 Gigabit Ethernet LAN Connector

Type: RJ45 connector. (Stacked LAN + USB Connector)

Pin Number	Function
1	TP0+
2	TP0-
3	TP1+
4	TP2+
5	TP2-
6	TP1-
7	TP3+
8	TP3-

3.2 USB Connectors

Type: Stacked USB Type A Connector, Male (Stacked LAN + USB Connector)

Pin Number	Function
1	Fused +5V
2	USB D-
3	USB D+
4	GND

3.2.1 COM1-6 Connectors

Type: 2x 6 pin header, 2.54 mm pitch

Pin Number	Function
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI
10	Key
11	+5V
12	+12V



3.2.2 VGA Connector

Type: on the motherboard 2x 6 pin header, 2.54 mm pitch

Pin Number	Function
1	DDC CLK
2	DDC DATA
3	+5V
4	VSYNC
5	HSYNC
6	GND
7	Red
8	GND
9	Green
10	GND
11	Blue
12	GND

behind the cable: type DSUB-15 pin, DSUB-15 Female

Pin Number	Function
1	RED
2	GREEN
3	BLUE
4	n.c.
5	GND
6	GND
7	GND
8	GND
9	+5V
10	GND
11	n.c.
12	DDC SDA
13	HSYNC
14	VSYNC
15	DDC SCL

3.2.3 Audio Connector

Type: Stacked Audio Jack

Port Number	Function
Top	Line in
Middle	Line out
Bottom	Microphone In



3.2.4 LPT connector

Pin Number	Function
1	/STROBE
2	/AUTOFD Autofeed
3	D0 Data Bit 0
4	/ERROR Error
5	D1 Data Bit 1
6	/INIT Initialize
7	D2 Data Bit 2
8	/SELIN Select In
9	D3 Data Bit 3
10	GND
11	D4 Data Bit 4
12	GND
13	D5 Data Bit 5
14	GND
15	D6 Data Bit 6
16	GND
17	D7 Data Bit 7
18	GND
19	/ACK Acknowledge
20	GND
21	Busy
22	GND
23	PE Paper End
24	GND
25	SEL Select
26	key

3.3 Connectors and Headers for internal Connection

3.3.1 SATA

Type: 7 pin SATA connector, LD180F-S16P (Foxconn) or equivalent.

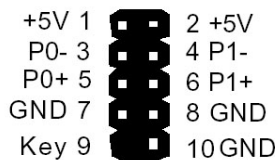
Pin Number	Function
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND



3.3.2 USB Header

Type: 2x5 pin headers, 2.54mm pitch.

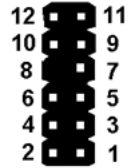
Pin Number	Function
1	+5V
2	+5V
3	D-
4	D-
5	D+
6	D+
7	GND
8	GND
9	Key
10	nc



3.3.3 Front Panel Interface Connector

Type: 2x6 pin header, 2.54mm pitch.

Pin Number	Function
1	Power switch +
2	Reset switch +
3	Power switch -
4	Reset switch -
5	Power LED +
6	Speaker -
7	Power LED -
8	nc.
9	HDD LED +
10	GND
11	HDD LED -
12	Speaker +



3.3.4 Cash Drawer Interface Connector

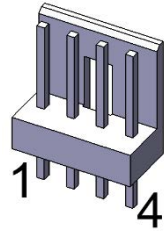
Type: 6 pin shrouded header

Pin Number	Function
1	CD status 1
2	CD out 1
3	GND
4	USB DP+
5	USB DP-
6	USB VBUS

3.3.5 Fan Connector (with PWM FAN Speed Control)

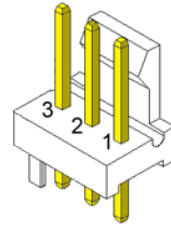
Type: 4 pin connector with Friction Lock, vertical.

Pin Number	Function
1	GND
2	+12V
3	FAN RPM
4	FAN PWM



3.3.6 Fan Connector (with DC FAN Speed Control)

Pin	Signal
1	GND
2	PWR
3	Sense



3.3.7 Intrusion Interface

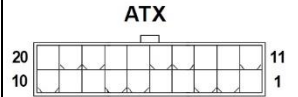
Type: 3 pin shrouded header, B3B-PH-K-S (JST) or equivalent.

Pin Number	Function
1	GND
2	Intrusion input
3	n.c.



3.3.8 ATX Power

Pin Number	Function
1,2,11	+3.3V
3,5,7,13,16,16,17	GND
4,6,19,20	+5V
8	Power ok
9	5V SB
10	+12V
12	-12V
14	PSON



4 Changing the Battery

The systems are equipped with a lithium battery on the motherboard to ensure data retention, the time and the setup parameters. The battery should be changed approximately every five years.



When inserting the new battery, make sure the polarity is correct. This is marked in the socket. Incorrect replacement of the battery may lead to the danger of explosion.

The battery is located in a socket on the Motherboard. To gain access to the battery, proceed as described in the according chapters of your **BEETLE User Manual**.




The lithium battery must be replaced only by identical batteries or types recommended by Diebold Nixdorf International.

You can return the used batteries to your Diebold Nixdorf International sales outlet. Batteries containing harmful substances are marked accordingly.

The chemical denotations are as follows: **CD** = Cadmium; **Pb** = Lead, **Li** = Lithium.



This symbol on a battery tells you that batteries containing harmful substances must not be disposed of as household waste. Follow the country specific laws and regulations. Within the  European Union you are legally bound to return these batteries to the service organization where you purchased the new battery.



The setup parameters must be reset each time the battery has been changed.

5 UEFI BIOS Setup

The mainboard comes with an AMI UEFI BIOS chip that contains the ROM Setup information of your system. This chip serves as an interface between the processor and the rest of the mainboard's components. This section explains the information contained in the Setup program and tells you how to modify the settings according to your system configuration.

Even if you are not prompted to use the Setup program, you might want to change the configuration of your system in the future. For example, you may want to enable the Security Password Feature or make changes to the power management settings. It will then be necessary to reconfigure your system using the BIOS Setup program so that the system can recognize these changes and record them in the NVRAM. All setup data is stored in a non-volatile memory (NVRAM). When you remove the battery, all settings, except the BIOS password, are set to default.

5.1 Standard UEFI BIOS Version

The UEFI BIOS ROM of the system holds the Setup utility. When you turn on the system, it will provide you with the opportunity to run this program. This appears during the Power-On Self-Test (POST). Press <F2> or click setup in the upper right corner to call the Setup utility. If you missed the opportunity to pressing the mentioned key, POST will continue with its test routines, thus preventing you from calling Setup. If you still need to call Setup, reset the system by pressing <Ctrl> + <Alt> + . You can also restart by turning the system off and then on again. But do so only if the first method fails.

If you like to change the boot order only once, you can press the <F10> key or click on BBS in the upper right corner during the POST is running. At the end you will see a Pop-Up window with all the devices the system has found. With the keys <UP> and <DOWN> you select the boot device.

The Setup program has been designed to make it as easy as possible. It is a menu-driven program, which means you can scroll through the various sub-menus and make your selections among the predetermined choices.

You can also use the mouse or the touch screen to navigate through the menus.

When you invoke Setup, the main program screen will appear. Read more about the Setup entries on the following pages.

Because the UEFI BIOS software is constantly being updated, the following UEFI BIOS screens and descriptions are for reference purposes only and may not reflect your UEFI BIOS screens exactly.

5.2 BIOS Menu Bar

Press the ON/OFF button until a beep is emitted. Press then the F2 button to start the BIOS menu. The top of the screen has a menu bar with the following sections:

Info	Use this menu for information only
Main	Use this menu to make changes to the basic system configuration.
Advanced	Use this menu to enable and make changes to the advanced features.
Security	Use this menu to enable a supervisor or user password and Intrusion Detection.
Power	Use this menu to configure the chipset specific options
Event Logs	Use this menu to change the Smbios Log configuration.
Boot	Use this menu to configure the default system device used to locate and load the Operating System.
Save & Exit	Use this menu to exit the current menu or specify how to exit the Setup program.



To access the menu bar items, press the right or left arrow key on the keyboard until the desired item is highlighted.

5.3 Legend Screen

The right frame displays the key legend. The keys in the legend frame allow you to navigate through the various setup menus. The following table lists the keys found in the legend with their corresponding alternates and functions.

Navigation Key(s)	Description of Functions
← or → (keypad arrows)	Select the menu item to the left or right.
↑ or ↓ (keypad arrows)	Moves the highlight up or down between fields.
Enter	Move into sub menu or change selected menu items
+ (plus key) - (minus key)	Change field contents.
<Tab>	Jumps from one field to the next.
<F1>	Opens a general Help Screen with extended information.
<F2>	Load previous values (Load last saved values)
<F3>	Load optimized values (Factory reset)
<F4>	Saves changes and exits Setup.
<Esc>	Opens a windows to select between exit and return to setup

5.4 General Help

In addition to the Item Specific Help window, the UEFI BIOS setup program also provides a General Help screen. This screen can be called from any menu by simply pressing <F1>. The General Help screen lists the legend keys with their corresponding alternates and functions.

5.5 Scroll Bar

When a scroll bar appears to the right of a help window, it indicates that there is more information to be displayed that will not fit in the window. Use <PgUp> and <PgDn> or the up and down keys to scroll through the entire help document.

Press <Home> to display the first page, press <End> to reach the last page. To exit the help window, press the <Enter> or <Esc> key.

5.6 Sub-Menu



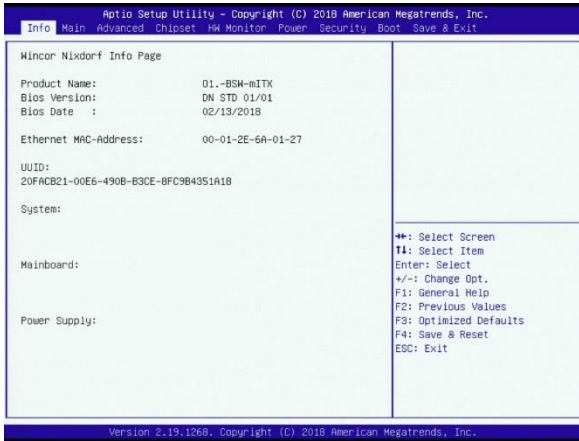
Note that a right pointer symbol “>” appears left of certain fields. This pointer indicates that a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter.

To call a sub-menu, simply move the highlight to the field and press <Enter>. The sub-menu then will appear immediately. Use the legend keys to enter values and move from field to field within a sub-menu just as you would do within a menu. Use the <Esc> key to return to the main menu.

Take some time to familiarize yourself with each of the legend keys and their corresponding functions. Practice navigating through the various menus and sub-menus. If you accidentally make unwanted changes to any of the fields, use the set default hot key <F3>. While moving around through the Setup program, note that explanations appear in the Item Specific Help window located to the right side of each menu. This window displays the help text for the currently highlighted field.

6 Info Screen

When the Setup program is accessed, the following info screen appears:



This screen is for information only. There is nothing that could be changed within Setup. All information is intended to facilitate the support of your system.

Product Name

This text is fixed for your mainboard with standard UEFI BIOS.

BIOS Revision

The UEFI BIOS version is displayed in the format WN STD xx/yy

xx	Core Version, never changes
yy	Release Version, changes with every update
zz	Internal Release, for tests only

The UEFI BIOS Date is displayed the date of release in international format: MM/DD/YYYY

Ethernet MAC-Address

The Ethernet MAC-Address of the on board LAN Controller is displayed at this line if this device is enabled.

UUID Info

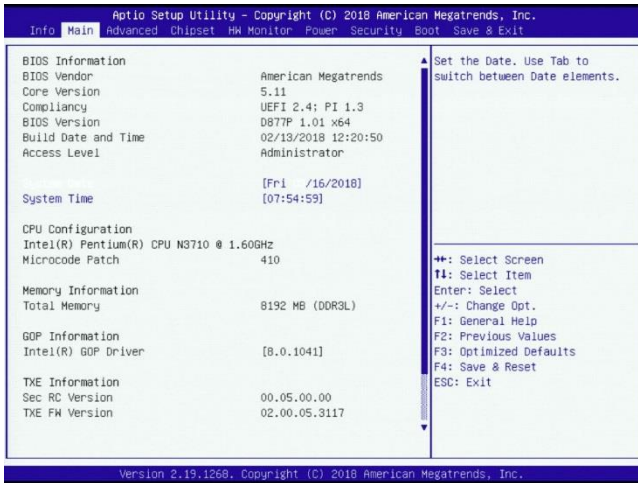
A UUID is an identifier standard used in software construction, standardized by the Open Software Foundation. The intent of UUIDs is to enable distributed systems to uniquely identify information without significant central coordination.

System, Mainboard, Power Supply

The default placeholders may be replaced by specific data from factory, describing configuration, serial number etc. for each device.

7 Main Menu

The Main Menu is entered, to determine the basic system configuration and to provide an overview. Some of the parameters are only available under certain conditions.



System date

Set the date.

Use Tab to switch between date elements.

Default ranges:

Year: 2005-2099

Days: dependent on month

System time

Set the time.

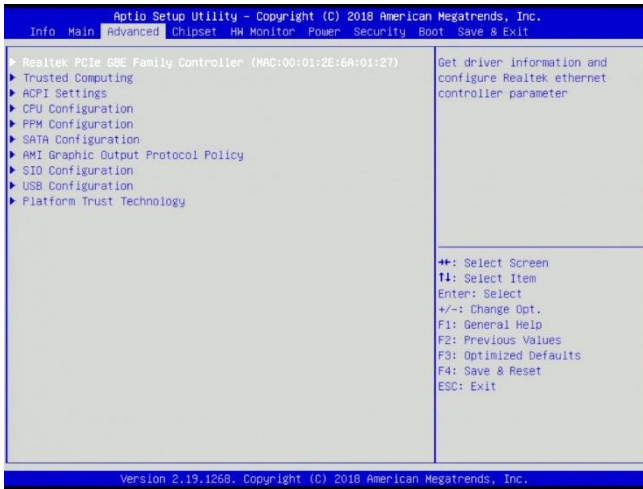
Use Tab to switch between time elements.

8 Advanced Menu

The advanced functions which are available to the system are configured in this menu for the advanced system configuration.

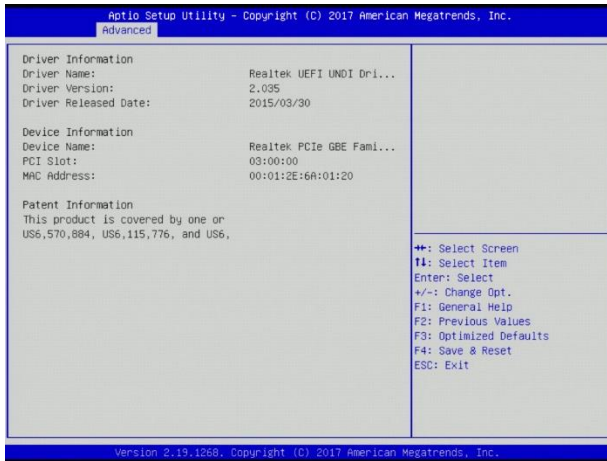
Only change the default settings if required for a special purpose.

Incorrect settings can cause malfunctions.

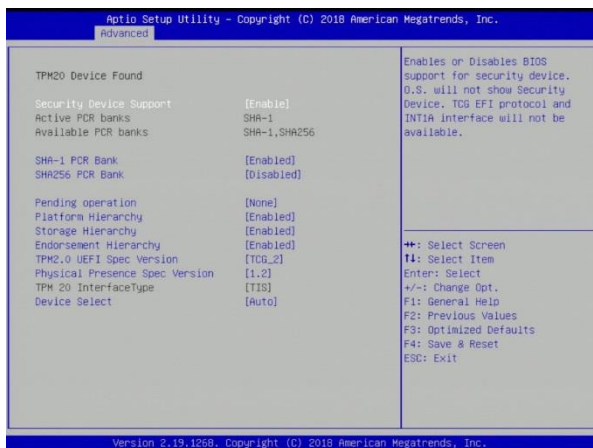


8.1 Realtek PCIe GBE Family Controller

Get driver information about the Realtek Controller.



8.2 Trusted Computing



Security Device Support [Enabled]

Enables or disables BIOS support for security device. O.S. will not show security device. TCG EFI protocol and INT1A interface will not be available.

SHA-1 PCR Bank [Enabled]

Enable or disable SHA-1 PCR Bank.

SMA256 PCR Bank [Disabled]

Enable or disable SMA256 PCR.

Pending Operation [None]

Option: [TPM Clear]. Schedule an operation for the security device. Note: Your computer will reboot during restart in order to change state of security device.

Platform Hierarchy [Enabled]

Enable or disable platform hierarchy.

Storage Hierarchy [Enabled]

Enable or disable storage hierarchy.

Endorsement Hierarchy [Enabled]

Enable or disable endorsement hierarchy.

TPM2.0 UEFI Spec Version [Enabled]

Select the TCG2 spec version support.

TCG_1.2: the compatible mode for WIN8/WIN10.

TCG_2.0: support new TCG2 protocol and event format for Win10 or later.

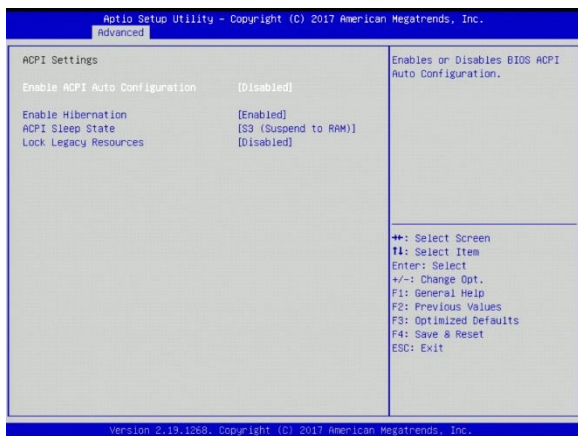
Physical Presence Spec Version [TCG.2]

Select to tell O.S. to support PP1 spec version 1.2 or 1.3. Note some HCK tests might not support 1.3.

Device Select [Auto]

TPM 1.2 will restrict support to TPM 1.2 devices. TPM 2.0 will restrict support to TPM 2.0 devices. Auto will support both with the default set to TPM 2.0 devices if not found, TPM 1.2 devices will be enumerated.

8.3 ACPI Settings



Enable ACPI Auto Configuration [Disabled]

Enables or disables BIOS ACPI auto configuration.

Enable Hibernation [Enabled]

Enables or disables system ability to hibernate (OS/S4 sleep state). This option may be not effective with some OS.

ACPI Sleep State [S3 (Suspend to RAM)]

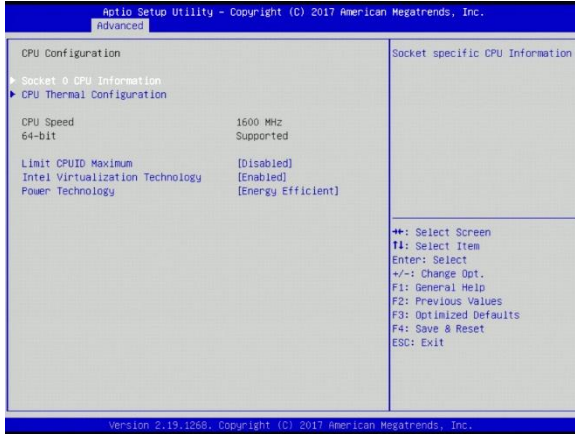
Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed. Function can be disabled.

LOCK Legacy Resources [Disabled]

Enables or disables lock of legacy resources.

8.4 CPU Configuration

Opens the CPU Configuration submenu. Some of the parameters are only available under certain conditions.



Socket 0 CPU information

Socket specific CPU information

CPU Thermal Configuration

Enable or disable DTS.

Limit CPUID Maximum [Disabled]

Disabled for Windows XP.

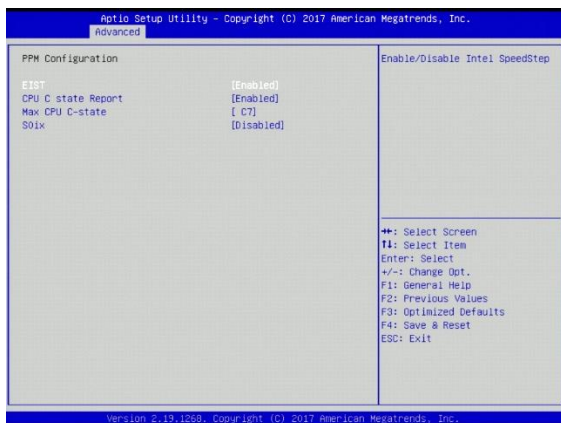
Intel Virtualization Maximum [Enabled]

When enabled a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Power Technology [Energy Efficient]

Enable the power management features. Options: Disabled and Custom.

8.5 PPM Configuration



EIST [Enabled]

Enable or disable Intel SpeedStep

CPU C state report [Enabled]

Enable or Disable CPU C state report to OS.

Max CPU C-state [C7]

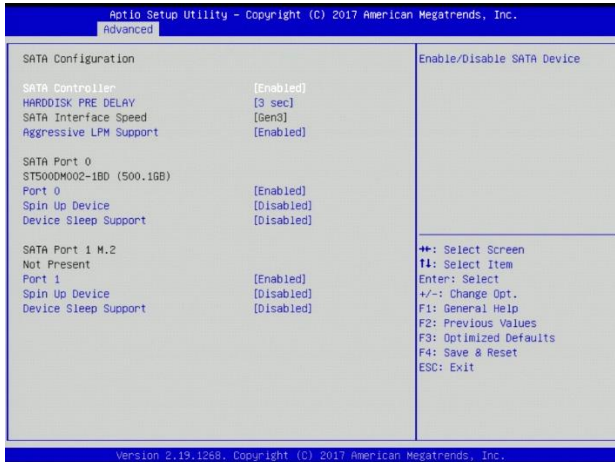
This option controls Max C state that the processor will support.

Option: C6 and C1.

SOix [Disabled]

Enable or disable CPU SOix state.

8.6 SATA Configuration



SATA Controller [Enabled]

Enable or disable SATA device

Harddisk Pre Delay [3 sec]

Choose different times.

SATA Interface Speed [Gen3]

Select SATA interface speed. CHV A1 always with Gen1 speed.
Option: Gen1 and Gen2.

Aggressive LPM Support [Enabled]

Enable PCH to aggressively enter link power state.

Port 0 [Enabled]

Enable or disable SATA port.

Port 1 [Enabled]

Enable or disable SATA port.

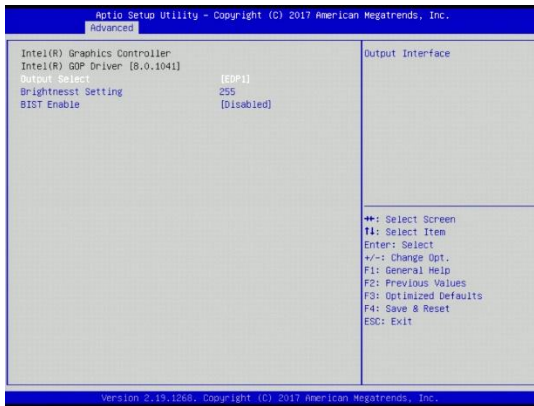
Spin Up Device [Disabled]

If enable for any ports staggered spin up will be performed and only the drives which have this option enabled will spin up to boot. Otherwise all drives spin up at boot.

Device Sleep Support [Disabled]

Enable or disable this function.

8.7 AMI Graphic Output Protocol Policy



Output Select [EDP1]

No choice available.

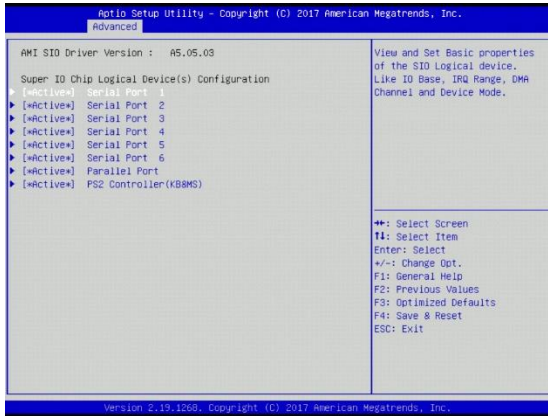
Brightness Settings [255]

Set the brightness settings.

BIST Enable [Disabled]

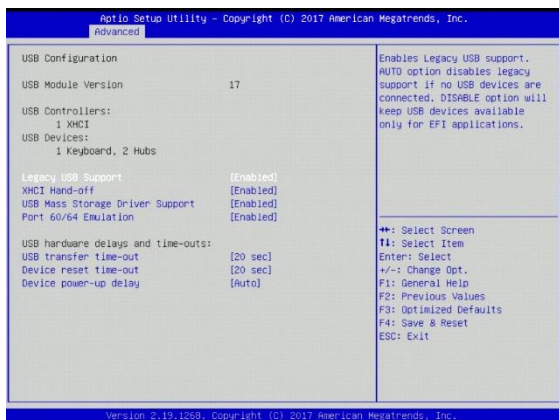
Starts or stops the BIST on the integrated display panel.

8.8 SIO Configuration



View and set basic properties of the SIO logical device as IO base, IRQ range DMA channel and device mode in this menu. Enable or disable the serial ports.

8.9 USB Configuration



Legacy USB Support [Enabled]

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.

XHCI Hand-off [Enabled]

This is a workaround for operating systems without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

USB Mass Storage Driver Support [Enabled]

Enable or disable USB mass storage driver support.

Port 60/64 Emulation [Enabled]

Enables I/O port 60h/64h emulation support. This should ne enables for the complete USB keyboard legacy support for non USB aware operating systems.

USB transfer time-out [20 sec]

The time-out value for control, bulk and internet transfers.

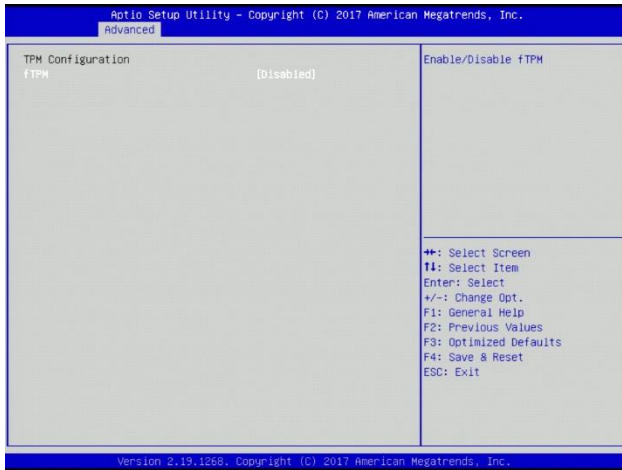
Device reset time-out [20 sec]

USB mass storage device start unit command time-out

Device power-up delay [Auto]

Maximum time the device will take before it properly reports itself to the most controller. AUTO uses default value: for a root port it is 100 ms. For a hub port the delay is taken from hub descriptor.

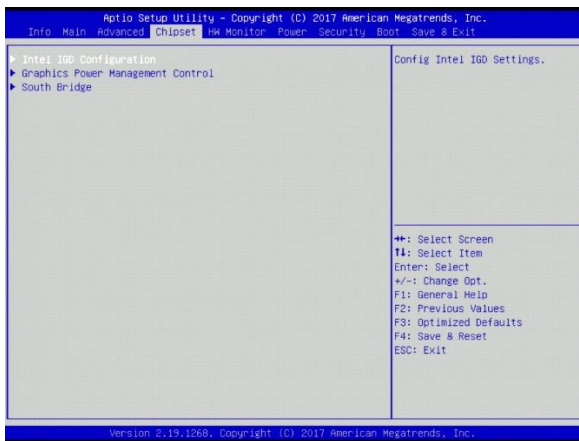
8.10 Platform Trust Technology



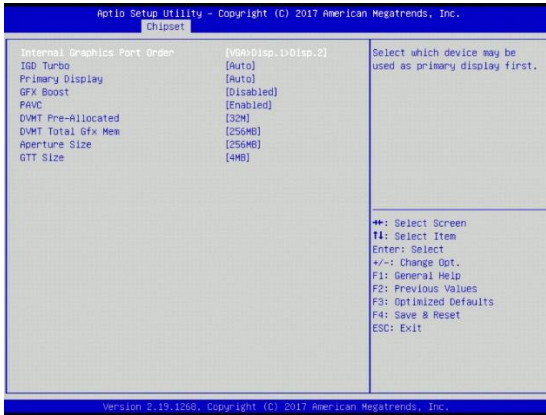
fTPM [Disabled]

Enable or disable the Firmware TPM here.

9 Chipset Menu



9.1 Intel IGD Configuration



Internal Graphics Port Order [VGA>Display.1>Display.2]

Select which device may be used as primary display.

Options: [Display.1>Display.2>VGA]
 [VGA>Display.2>Display.1]
 [Display.2>Display.1>VGA]
 [Display.1>VGA>Display.2]
 [Display.2>VGA>Display.1]

IGD Turbo [Auto]

Select the IGD Turbo feature if AUTO is selected. IGD Turbo will only be enabled when SOC stepping is BO or above. Options: Enable and Disable.

Primary Display [Auto]

Select which of IGD/PCI graphics device should be primary display.

GFX Boost [Disabled]

Enable or disable GFX boost.

PAVC [Enabled]

Enable or disable the protected audio video control.

DVMT Pre-Allocated [32M]

Select DVMT 5.0 pre allocated (fixed) graphics memory size used by the internal graphics device. Options: 32M – 512M.

DVMT Total Gfx Mem [256MB]

Select DVMT 5.0 total graphics memory size used by the internal graphics device. Options: 128MB, 256MB and Max.

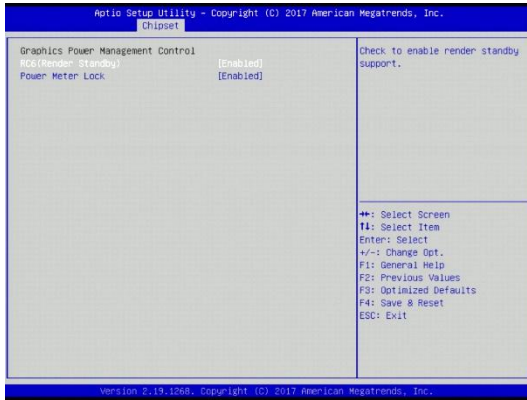
Aperture Size [256MB]

Fix.

GTT Size [4MB]

Select the GTT size. Options: 2MB, 4MB and 8MB.

9.2 Graphics Power Management Control



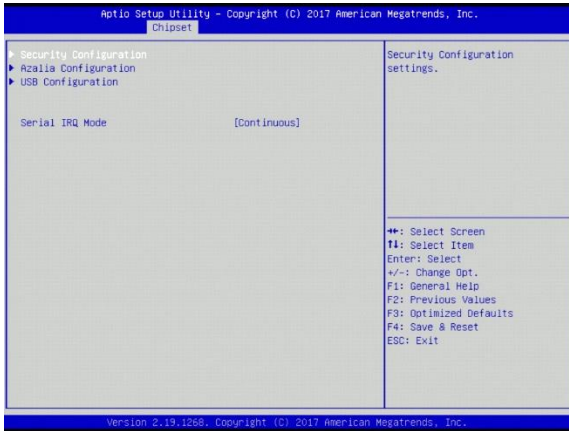
RC6 (Render Standby) [Disabled]

Check to enable render standby support.

Power Meter Lock [Enabled]

Enable or disable power meter lock.

9.3 South bridge



Security Configuration

Set the parameter for the security configuration.

Azalia Configuration

Azalia HD Audio options.

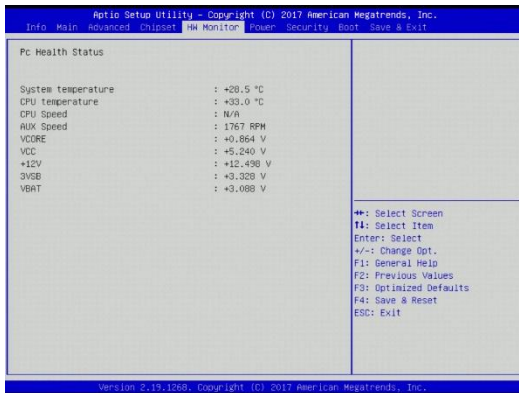
USB Configuration

USB configuration settings.

Serial IRQ Mode

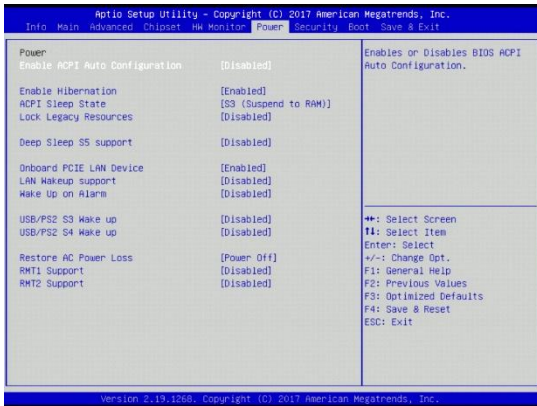
Configure the serial IRQ mode.

10 Hardware Monitor



Get here information about the system health status.

11 Power



Enable ACPI Auto Configuration [Disabled]

Enable or disable the BIOS ACPI auto configuration

Enable Hibernation [Enabled]

Enable or disable system ability to hibernate (OS/S4 sleep state). This option may be not effective with some operating systems.

ACPI Sleep State [S3 (Suspend to RAM)]

Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed. Can be disabled.

Lock Legacy Resources [Disabled]

Enable or disable lock of legacy resources.

Deep Sleep SS support [Disabled]

Enable or disable the deep sleep SS function.

Onboard PCIE LAN Device [Enabled]

Control the PCI Express root port.

LAN Wakeup support [Disabled]

Disable or enable the LAN wake up function.

Wake Up on Alarm [Disabled]

Enable or disable system wake up on alarm event. When enabled, system will wake on the hr::min::sec specified.

USB/PS2 S3 Wake up [Disabled]

Enable or disable the USB/PS2 S3 wake up.

USB/PS2 S4 Wake up [Disabled]

Enable or disable the USB/PS2 S4 wake up.

Restore AC Power Loss [Power Off]

Select AC power state when power is re-applied after a power failure.

Options: Follow AC Power and Last State.

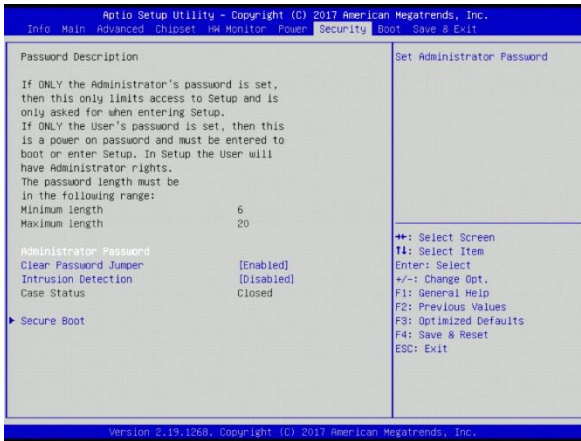
RMT1 Support [Disabled]

This is used for DVI1 RMT Support.

RMT2 Support [Disabled]

This is used for DVI2 RMT Support.

12 Security



Clear Password Jumper [Enabled]

Can disable the password clear jumper.

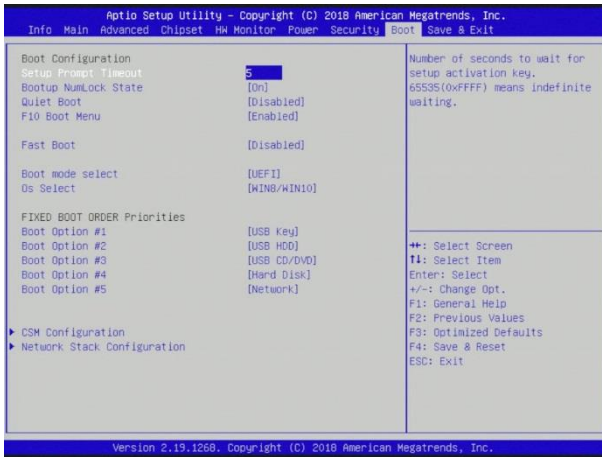
Intrusion detection [Disabled]

Enable or disable the intrusion detection.

Secure Boot [Custom]

Customizable secure boot settings. Option: Standard

13 Boot



Setup Prompt Timeout [S]

Number of seconds to wait for setup activation key. 65535 (0xFFFF)(means indefinite waiting).

Bootup NumLock State [Off]

Select the keyboard NumLock state.

Quiet Boot [Disabled]

Enable or disable the quiet boot option.

F10 Boot Menu [Enabled]

Enable or disable F10 boot order popup menu.

Fast Boot [Disabled]

Enable or disable boot with initialization of a minimal set of devices required to launch active boot option. This has no effect for BBS boot options.

Boot mode select [UEFI]

Select boot mode LEGACY/UEFI.

OS Select [Win8/Win10]

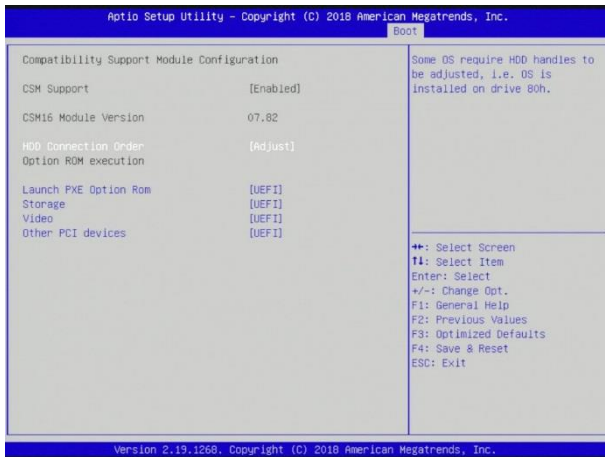
Select the operation system type.

- Win7: LPSS device is in PCI mode, which will adapt to PCI mode OS driver.
- Win8/win10: LPSS device is in ACPI mode, which will adapt to ACPI mode OS driver.
- Other: Consist with customer OS requirement (e.g. WNLPOS) Current setting is for PCI mode.

Boot option

Set the system boot order in this menu.

13.1 CSM Configuration



CSM Support [Enabled]

Setting may not be changed.

HDD Connection Order [Adjust]

Adjust or keep the HDD configuration.

Launch PXE Option Rom [UEFI]

Configuration options: [Do not launch], [UEFI], [Legacy]

Storage

Configuration options: [Do not launch], [UEFI], [Legacy]

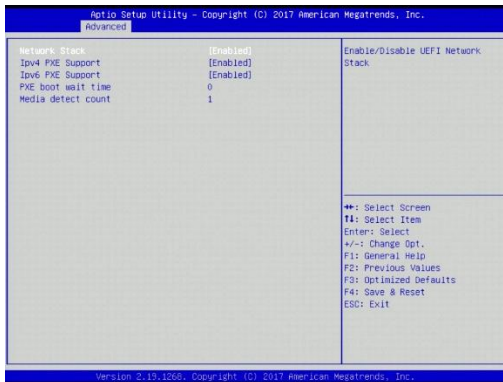
Video

Configuration options: [Do not launch], [UEFI], [Legacy]

Other PCI devices

Configuration options: [Do not launch], [UEFI], [Legacy]

13.2 Network Stack Configuration



Network Stack [Enabled]

Enable or disable UEFI network stack.

Ipv4 PXE Support [Enabled]

Enable here Ipv4 PXE boot support. If disabled Ipv4 PXE boot an option will not be created.

Ipv6 PXE Support [Enabled]

Enable here Ipv6 PXE boot support. If disabled Ipv6 PXE boot an option will not be created.

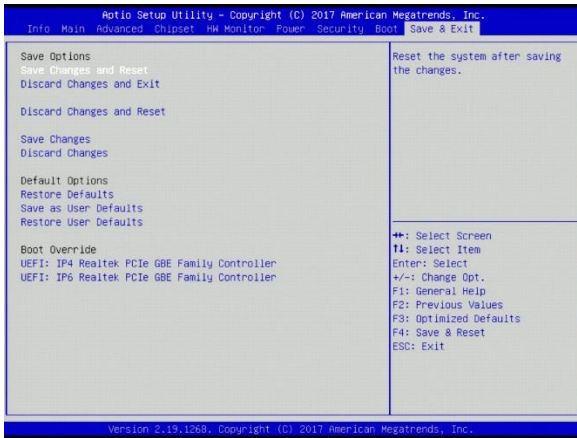
PXE boot wait time [0]

Wait time to press ESC key to abort the PXE boot.

Media detect count [1]

Number of times presence of media will be checked.

14 Save & Exit



Save Changes and Reset

Reset the system after saving the changes.

Discard Changes and Exit

Exit system setup without saving any change.

Discard Change and Reset

Reset system setup without saving any change.

Save Changes

Save changes done so far to any of setup options.

Discard Changes

Discard changes done so far to any of setup options.

Restore Defaults

Restore/Load default values for all the setup options.

Save as User Defaults

Save changes done so far as user defaults.

Restore User defaults

Restore the user defaults to all the setup options.

15 Abbreviations

ADM	AMI Display Manager
ACPI	Advanced Configuration and Power Interface
AGTL+	Assisted Gunning Transceiver Logic
APC	Advanced Power Control
APIC	Advanced Peripheral Interrupt Controller
APM	Advanced Power Management
AT	Advanced Technology
ATA	AT Attachment
BAT	Basic Access Test
BBS	BIOS Boot Specification
BDA	BIOS Data Area
BGA	Ball Grid Array
BIOS	Basic Input and Output System
CMOS	Complementary Metal Oxide Semiconductor
CPLD	Complex Programmable Logic Device
CPU	Central Processing Unit
CRT	Cathode-ray Tube
DIM	Device Initialization Manager
DIMM	Dual Inline Memory Module
DMA	Direct Memory Access
DMI	Desktop Management Interface
DVMT	Dynamic Video Memory Technology
DVI	Digital Video Interface
EBDA	Extended BIOS Data Area
ECP	Extended Capabilities Port
EEPROM	Electrical Erasable Read Only Memory
EFI	Extensible Firmware Interface
E-IDE	Enhanced Integrated Drive Electronics
EMS	Expanded Memory System
ESCD	Extended System Configuration Data
EPP	Enhanced Parallel Port
FSB	Front Side Bus

GPNV	General Purpose Non-Volatile (RAM)
GTL	Gunning Transceiver Logic
HW	Hardware
IDE	Integrated Drive Electronics
IGD	Internal Graphic Device
IPL	Initial Program Load (Device)
LAN	Local Area Network
LBA	Logical Block Addressing
LCD	Liquid Crystal Display
MAC	Media Access Control
MTRR	Memory Type Range Register
MP	Multiple Processors
NA	Power failure
NVRAM	Non-volatile Random Access Memory
P-ATA	Parallel AT Attachment (old version of hard disk interface)
POS	Point of Sales
PCI	Peripheral Component Interconnect
PnP	Plug and Play
POST	Power On Self Test
RAM	Random Accessible Memory
RI	Ring Indicator
ROM	Read Only Memory
RS	Retail Systems
SATA	Serial AT Attachment (new version of hard disk interface)
SLP	System Locked Pre-Installation
SMI	System Management Interrupt
SMM	System Management Mode
SMRAM	System Management RAM
SPGA	Staggered Pin Grid Array

TFT	Thin-film transistor
TPM	Trusted Platform Module
UEFI	Unified Extensible Firmware Interface
UPS	Uninterruptible Power Supply
USB	Universal Serial Bus
UUID	Universal Unique Identifier
VGA	Video Graphics Array
WOL	Wake On LAN
WOM	Wake On Modem

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