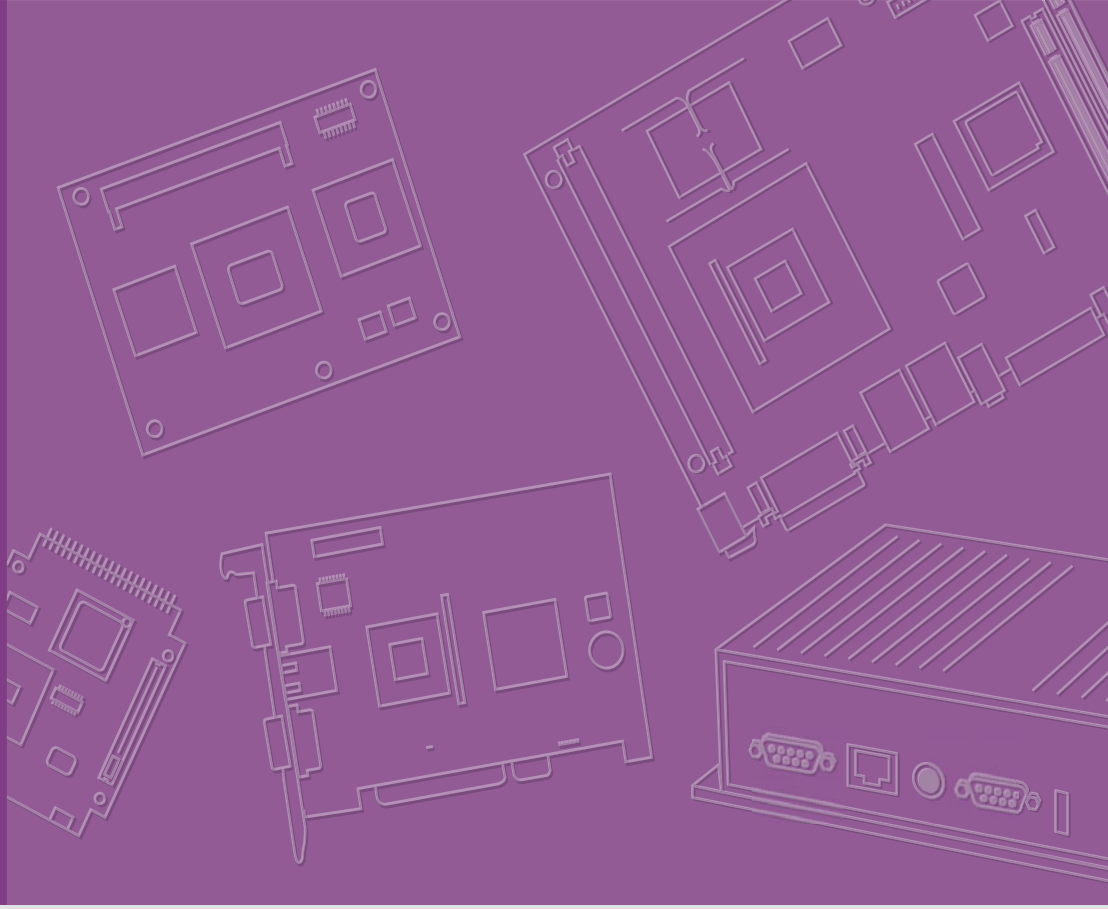


User Manual

FWA-T011

TINY NETWORK PLATFORM

ADVANTECH

Enabling an Intelligent Planet

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CE

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2. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
   - Product name and serial number
   - Description of your peripheral attachments
   - Description of your software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wording of any error messages
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   http://www.advantech.com/ePlatform/
   For technical support and service, please visit our support website at: http://support.advantech.com.tw/support/

Warnings, Cautions and Notes

Warning! *Warnings indicate conditions, which if not observed can cause personal injury!*



Caution! *Cautions are included to help you avoid damaging hardware or losing data. e.g.*



There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Note! *Notes provide optional additional information.*



Document Feedback

To assist us in making improvements to this manual, we would welcome comments and constructive criticism. Please send all such - in writing - to: support@advantech.com

Safety Instructions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a reliable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
    - The power cord or plug is damaged.
    - Liquid has penetrated into the equipment.
    - The equipment has been exposed to moisture.
    - The equipment does not work well, or you cannot get it to work according to the user's manual.
    - The equipment has been dropped and damaged.
    - The equipment has obvious signs of breakage.
15. Do not leave this equipment in an environment where the storage temperature may go below -40°C (-40°F) or above 85°C (185°F). This could damage the equipment. The equipment should be in a controlled environment.
16. Caution: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer, discard used batteries according to the manufacturer's instructions.
17. The sound pressure level at the operator's position according to IEC 704-1:1982 is no more than 70 dB (A).
18. RESTRICTED ACCESS AREA: The equipment should only be installed in a Restricted Access Area.
19. DISCLAIMER: This set of instructions is given according to IEC 704-1. Advantech disclaims all responsibility for the accuracy of any statements contained herein.

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Chapter 1

INTRODUCTION

1.1 Overview

FWA-T011 is designed for tiny table-top network appliance based on Intel® Apollo Lake SoC platform, includes Celeron® and Pentium® Processor for 2core and 4core SKUs. Due to its compact low-profile and fan-less design with mechanical dimension of 152 x 21 x 125 mm (5.9" x 0.8" x 4.9") in Width x Height x Depth, FWA-T011 is an ideal network platform for entry-level network applications. Scenario such as Virtual Private Network(VPN), Content Filtering, Unified Threat Management(UTM), Network Security Gateway, and Fire-wall is an ideal deployment example.

FWA-T011 features 4x Gb-Ethernet port, 1x RJ-45 console port, and 1x HDMI port that allow end-users to access easily and conduct configuration setup based on diverse application scenarios. Furthermore, FWA-T011 also features 2x TypeA USB2.0 port that improves end-users' input/output flexibility and accessibility.

In terms of the peripheral option, 1x M.2 2280 NGFF slot is reserved for storage; 1x So-DIMM slot is reserved for Non-ECC memory module, support DDR3L 1333/1600/1867 MHz memory with capacity up to 8GB. Besides, optional wireless design is available by reserving 1x M.2 2230 NGFF slot for Wifi module and 1x M.2 3042 NGFF slot for 3G/4G LTE module with single SIM card holder.

Except table-top application scenario (deploying it horizontally), FWA-T011 also comes with wall mound kit, which allows end-users to deploy it vertically based on diverse application set in the real world.

1.2 System Outlook

1.2.1 FRONT VIEW

At front side, FWA-T011 features Power button, 2x TypeA USB2.0 port, SW defind button, and LED indicators for power/storage/WAN/WLAN/SWdefined for input/output accessibility and system management.

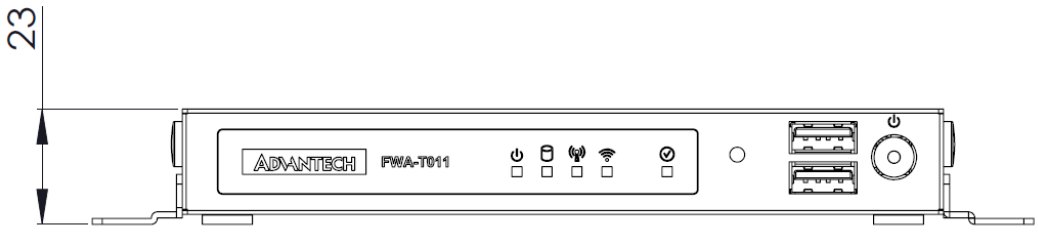


Figure 1.1 Front View

1.2.2 REAR VIEW

At rear side, FWA-T011 features 12V DC power jack, 1x RJ45 console port, 4x Gb-Ethernet port, 1x HDMI port for input/output accessibility and network connection.

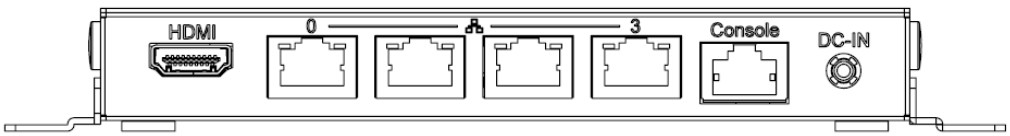


Figure 1.2 Rear View

1.2.3 SIDE VIEW (LEFT)

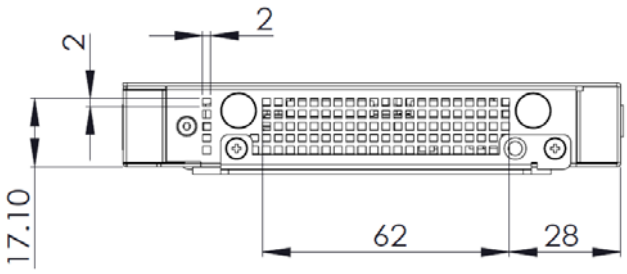


Figure 1.3 Side View (LEFT)

1.2.4 SIDE VIEW (RIGHT)

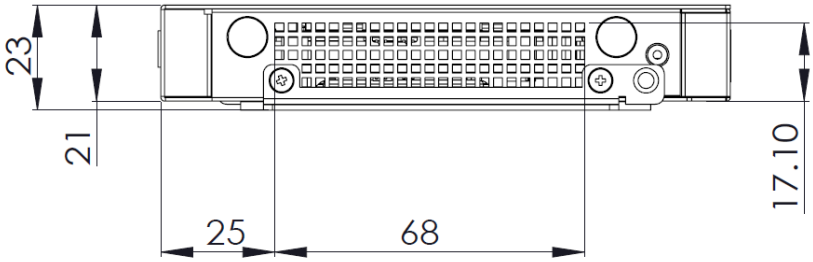


Figure 1.4 Side View (RIGHT)

1.2.5 TOP VIEW

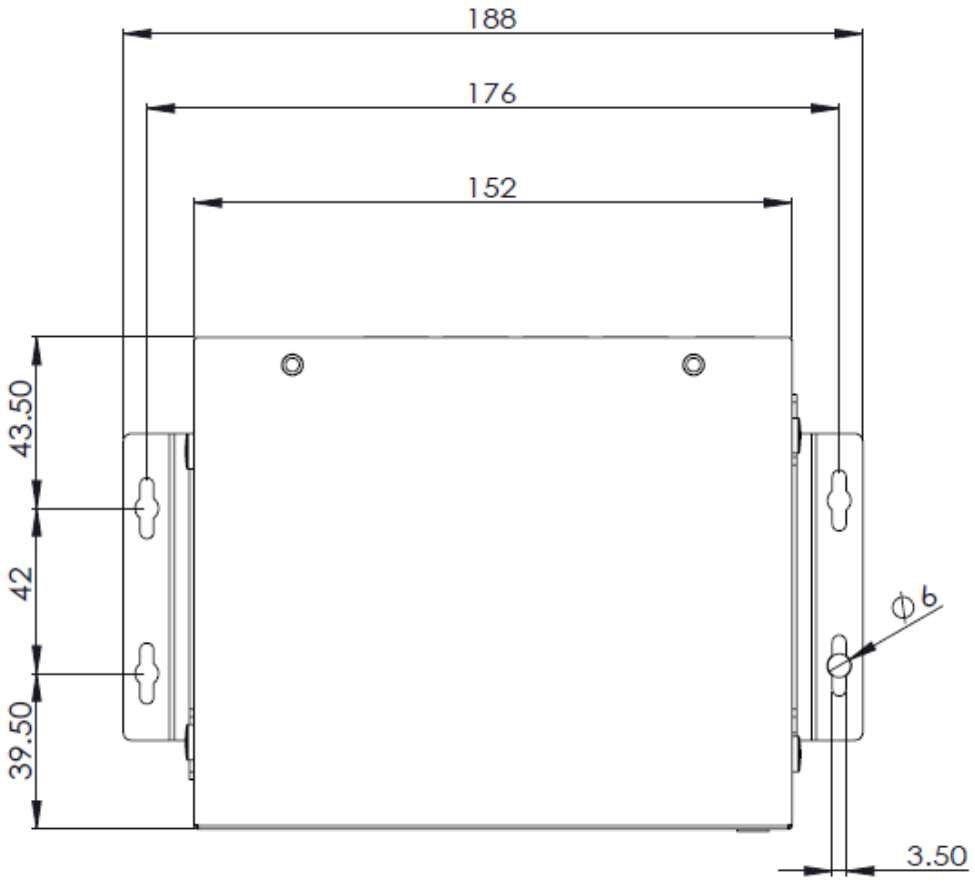


Figure 1.5 Top View

1.2.6 BOTTOM VIEW

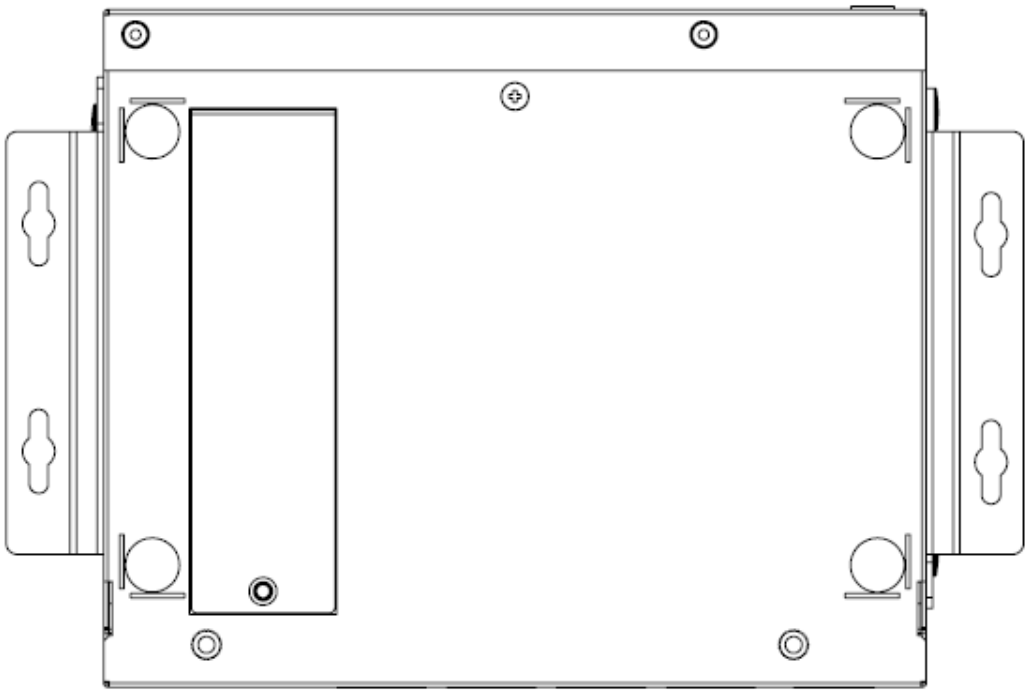


Figure 1.6 Bottom View

1.3 System Layout & Architecture

1.3.1 SYSTEM LAYOUT

System layout as below:

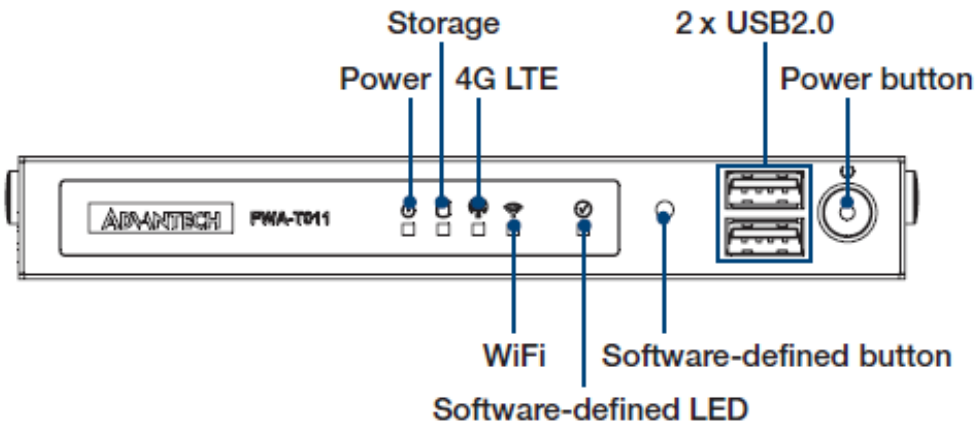


Figure 1.7 System Layout (Front)

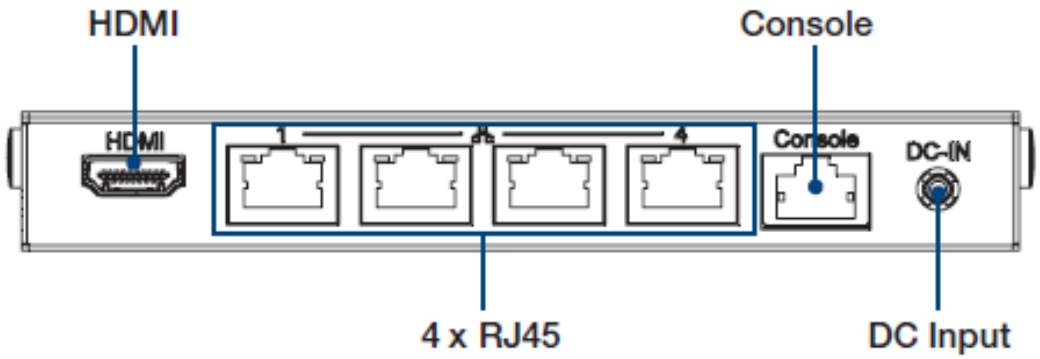


Figure 1.8 System Layout (Rear)

1.3.2 SYSTEM ARCHITECTURE

System Architecture as below:

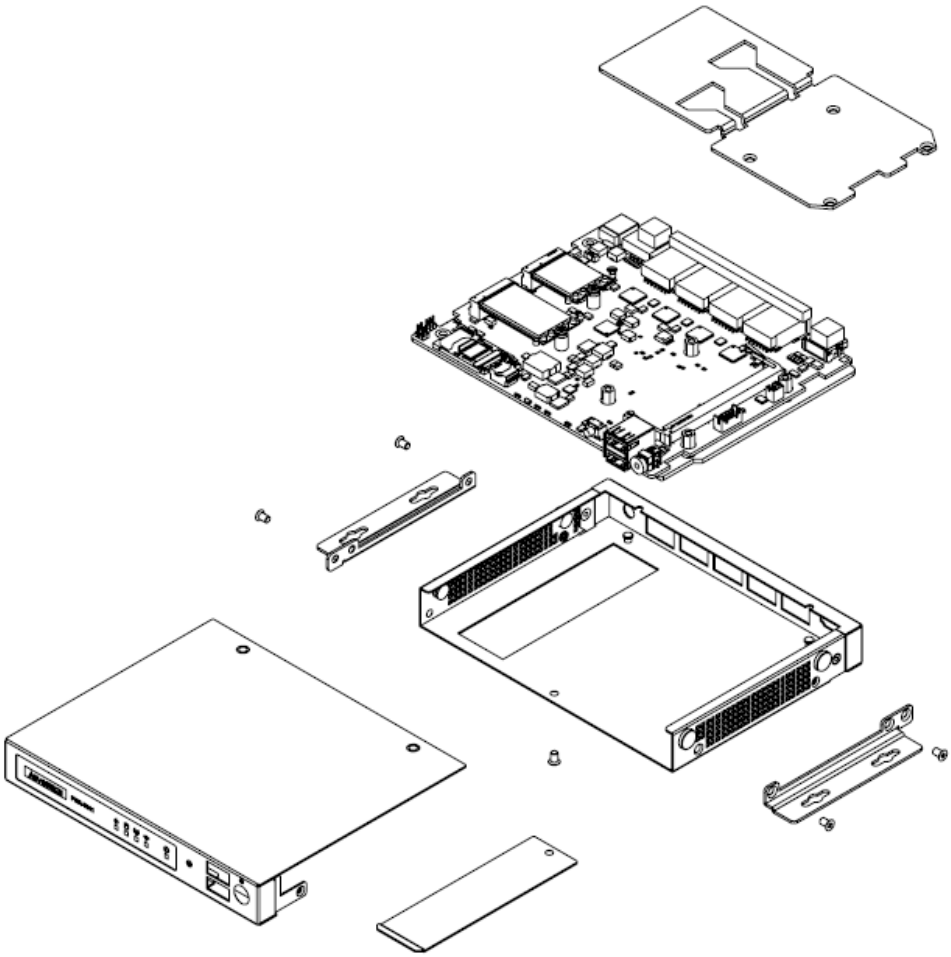


Figure 1.9 System Architecture

1.4 Block Diagram & System Diagram

1.4.1 BLOCK DIAGRAM

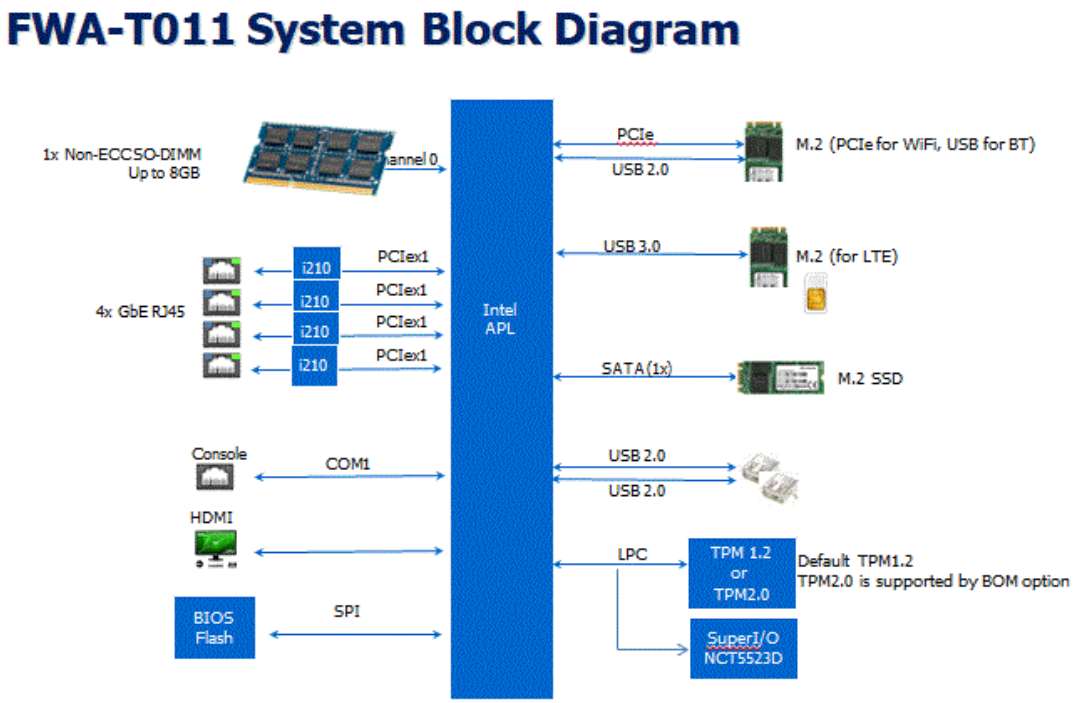


Figure 1.10 Block Diagram

1.5 System Diagram

1.5.1 SYSTEM DIAGRAM WITH HEATSINK

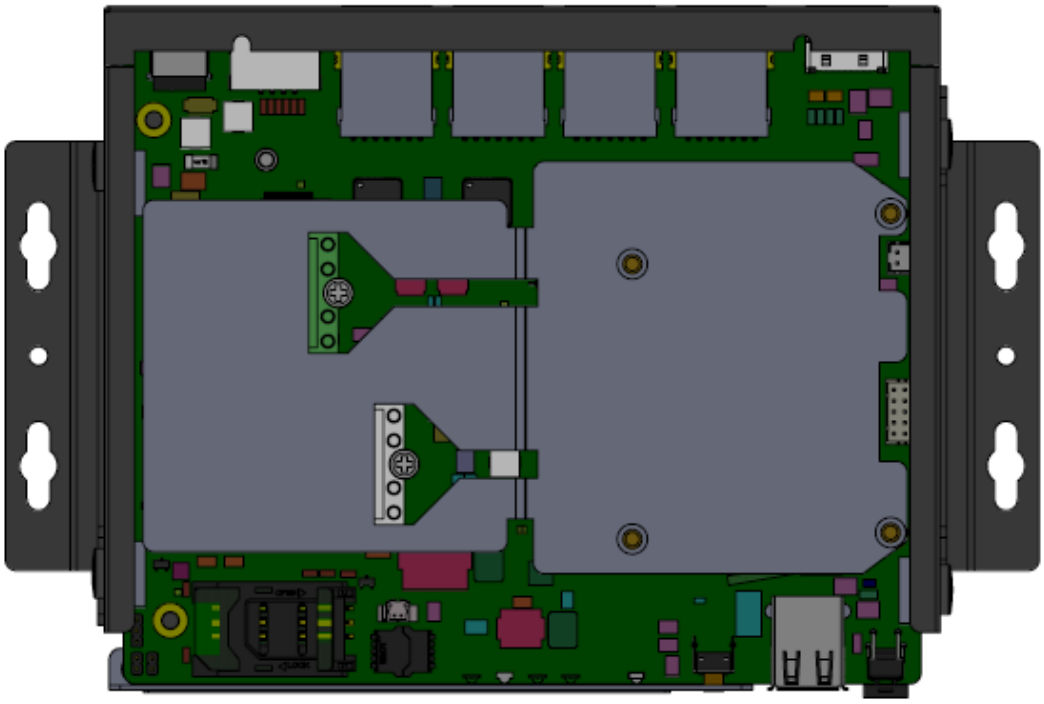


Figure 1.11 System Diagram with Heatsink

1.5.2 SYSTEM DIAGRAM WITHOUT HEATSINK

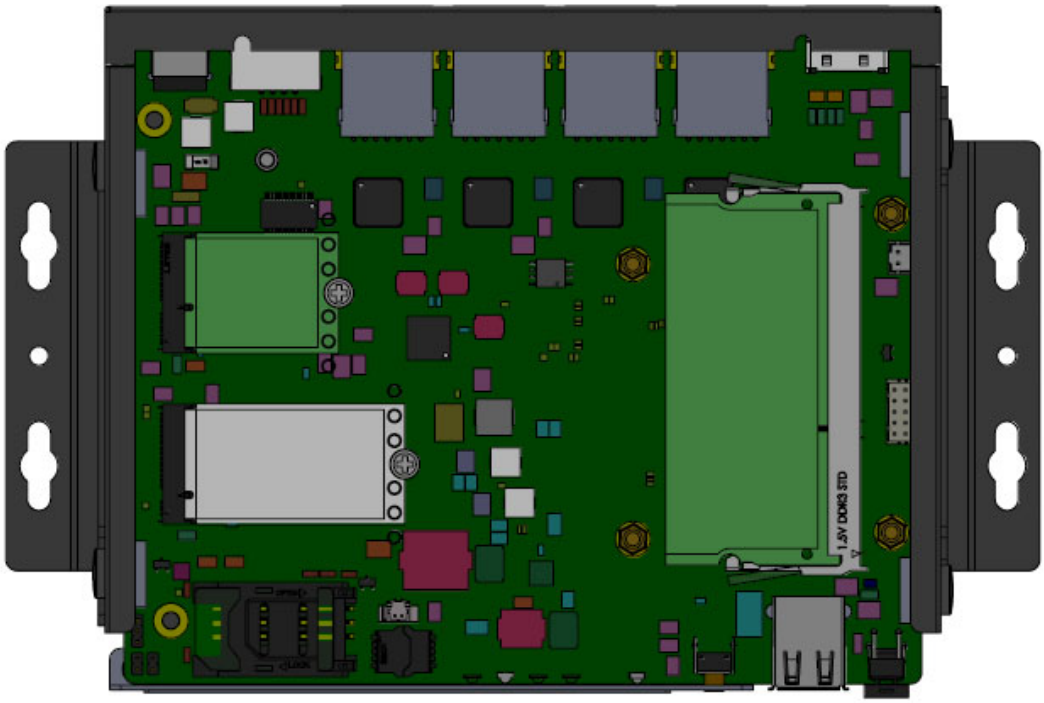


Figure 1.12 System Diagram without Heatsink

1.6 Component Installation

1.6.1 MEMORY

FWA-T011 features 1x 204pin So-DIMM slot reserved for 1600 MHz/1833Mhz Non-ECC DDRIII memory. Maximum capacity is 8G. Install Memory module as schematic diagram below

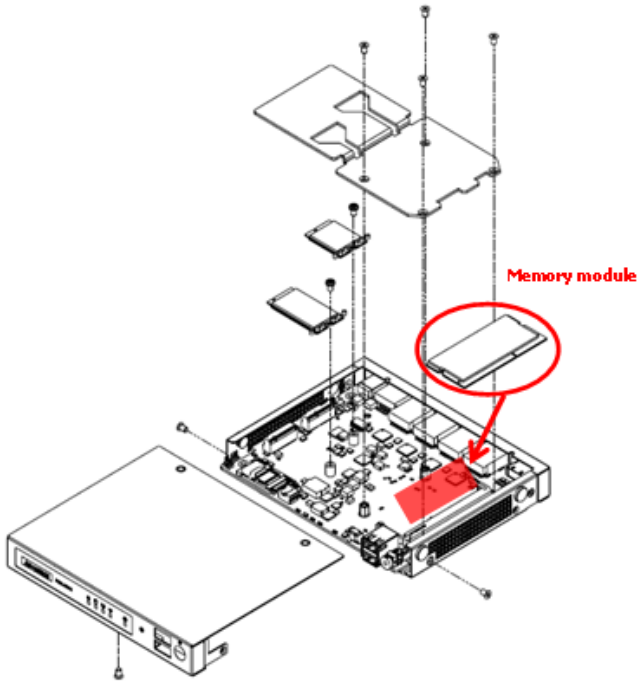


Figure 1.13 Memory Installation

Before install memory module, make sure the thermal pad has been attached.



Figure 1.14 Example of Memory Module Installation

1.6.2 STORAGE

FWA-T011 features 1x M.2 2280 NGFF slot reserved for M.2 SATA3 SSD.

Install storage as schematic diagram below

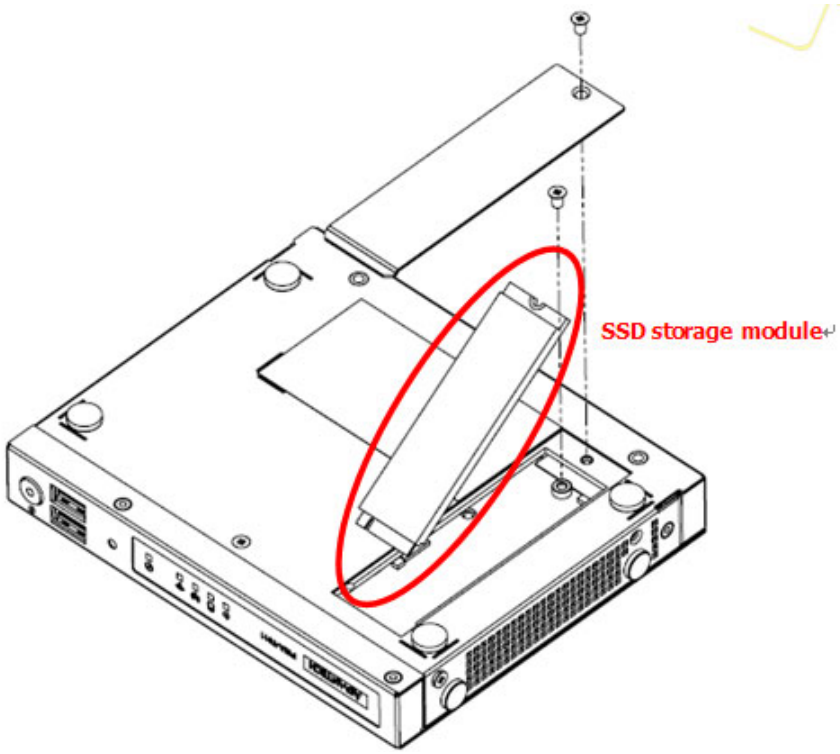


Figure 1.15 Storage Installation

Make sure the specification of SSD storage module that is going to inserted is M.2 2280 SATA3. The storage socket is "M-Key" type socket. It is compatible with the SSD storage module that is using "M-Key" or "B & M Key" edge connector.

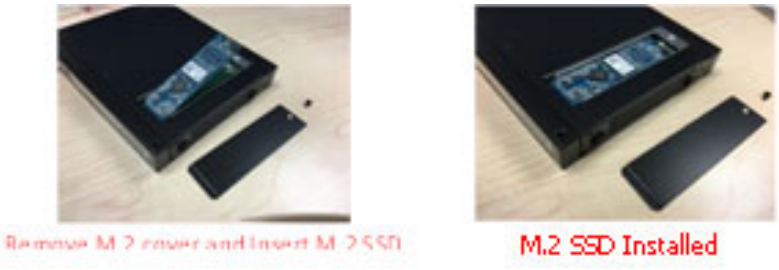


Figure 1.16 Example of SSD Storage Module Installation

1.6.3 WIFI (OPTIONAL)

FWA-T011 features 1x M.2 2230 NGFF slot reserved for Wifi module. Install Wifi module as schematic diagram below

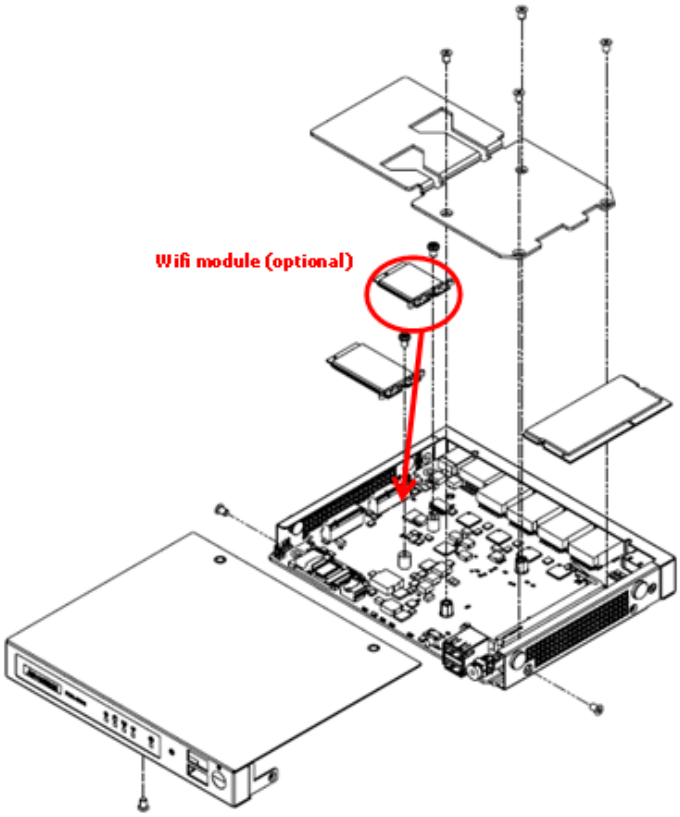


Figure 1.17 Wifi Module Installation (Optional)

Before install Wifi module, make sure the thermal pad has been attached

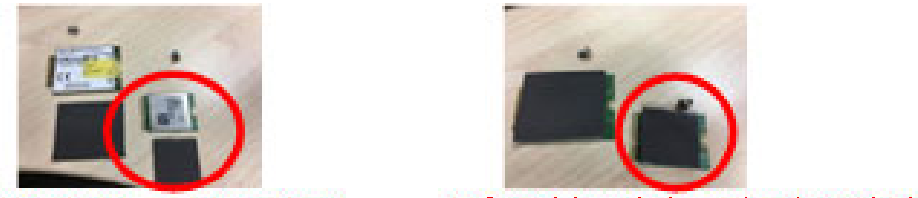


Figure 1.18 Example of Wifi Module Installation

1.6.4 3G/4G LTE (OPTIONAL)

FWA-T011 features 1x M.2 3042 NGFF slot reserved for 3G/4G LTE module. Install 3G/4G LTE module as schematic diagram below

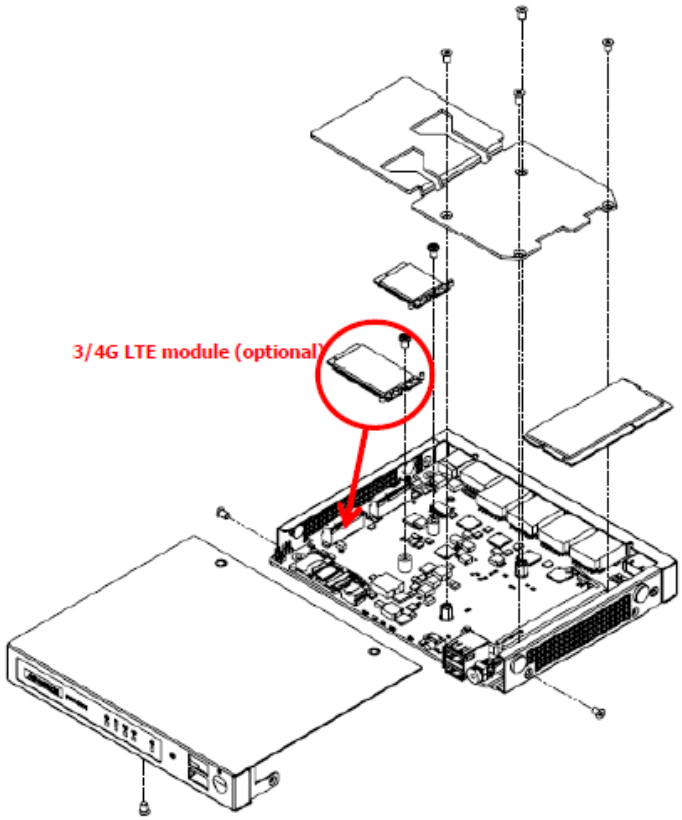


Figure 1.19 3G/4G LTE Module Installation(Optional)

Before install 3G/4G LTE module, make sure the thermal pad has been attached


3G/4G LTE Module and thermal pad

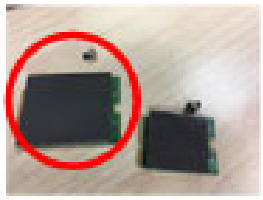

3G/4G LTE module with thermal pad attached

Figure 1.20 Example of 3G/4G LTE Module Installation

1.7 Operation Environment

1.7.1 TEMPERATURE REQUIREMENT

Please make sure environment condition before power on this system:

- Operating temperature 0 ~ 40 °C (32 ~ 104 °F)
- Non-operating Temperature -20 ~ 80° C (-4 ~ 167° F)
- Relative humidity 95% @ 40° C (non-condensing)
- Storage temperature -40 ~ 85° C (-40 ~ 185° F)

1.8 Mounting Instructions

1.8.1 WALL MOUNT KIT

FWA-T011 comes with the wall mount kit. Install wall mount kit as schematic diagram below

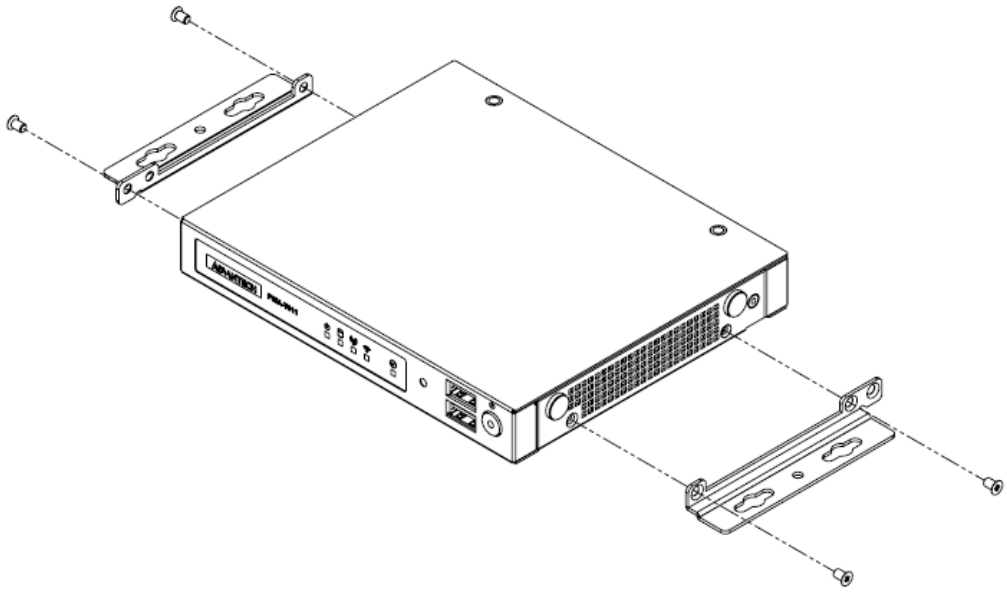


Figure 1.21 Wall Mounting Kit

Chapter 2

OPERATION

2.1 Power up/down

To power up, press the Power button.

Before powering down for any upgrade or maintenance procedures, perform a backup of critical data and programs.

To power down, use one of the following methods:

- Press and release the power button.
  This method initiates a controlled shutdown of applications and the OS before the server enters standby mode.
- Press and hold the Power button for more than 4 seconds to force FWA-T011 to enter standby mode. This method forces FWA-T011 to enter standby mode without properly exiting applications and the OS. If an application stops responding, you can use this method to force a shutdown.

2.2 Booting from network via PXE

To boot an OS via network, please make sure the following BIOS options In the Advanced: Network Stack Configuration Menu are configured properly:

Table 2.1: PXE BIOS Options

Network Stack	Enabled	Enables the UEFI Network Stack.

Below are the steps to enable PXE boot.

1. It needs to set BIOS/Post & Boot -> Network Stack as enabled (default setting is disabled)

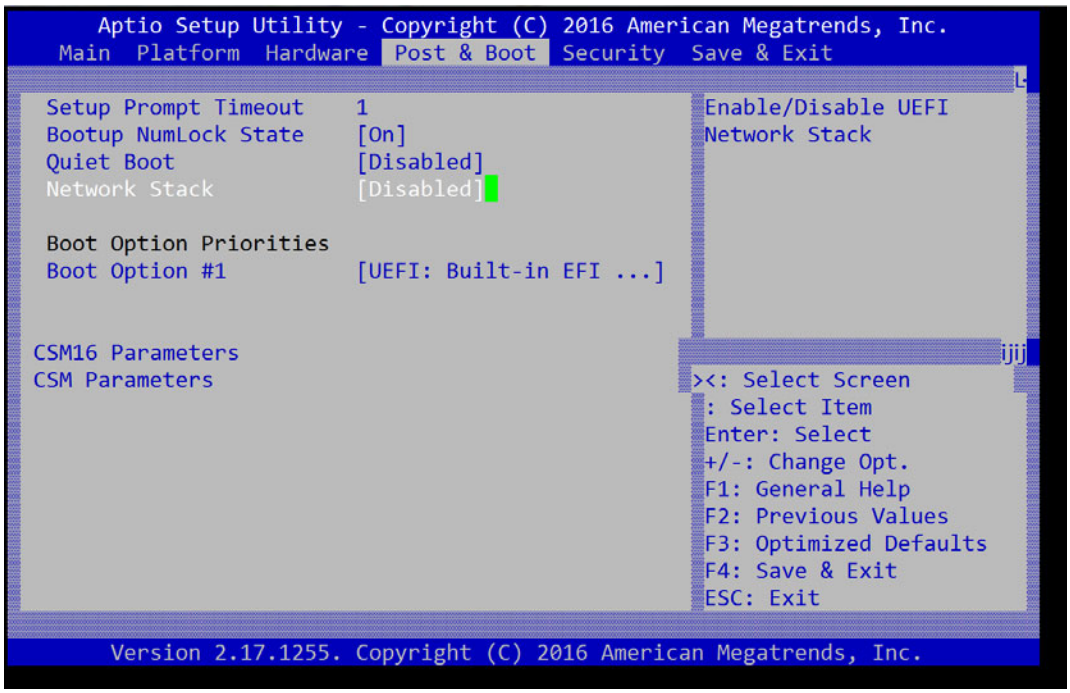


Figure 2.1 Enable PXE boot_1.

2. When set Network Stack is enabled, and then go to item of " BIOS/ Post & Boot -> CSM Parameters -> Network" to enable PXE ROM function, set it as "UEFI" (IPV4 PXE) function .

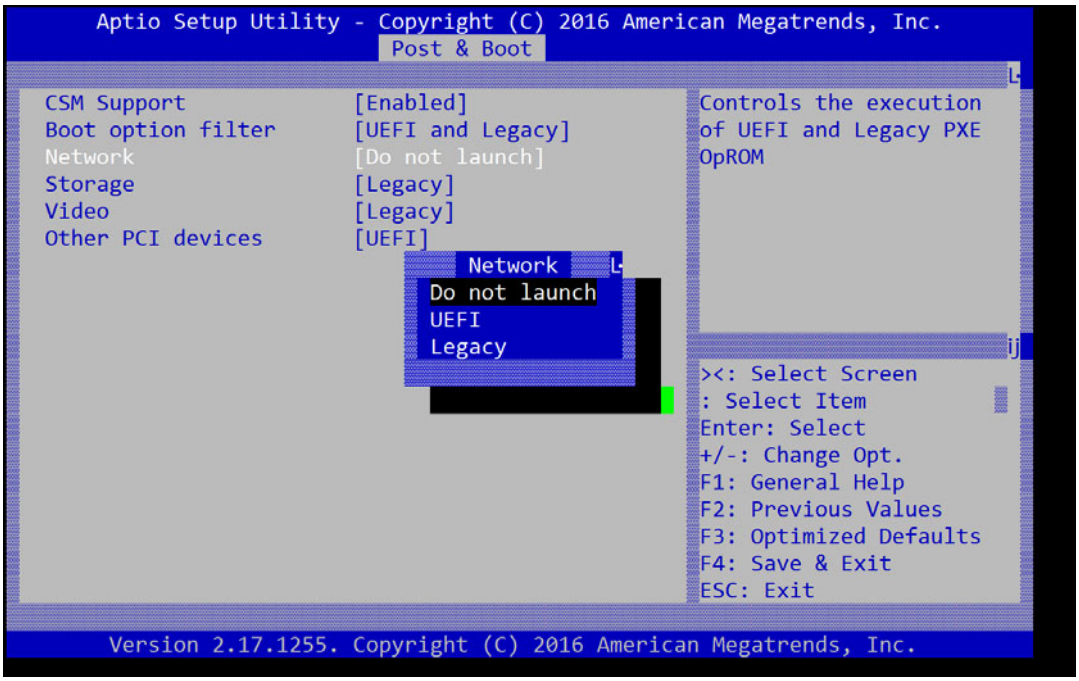


Figure 2.2 Enable PXE boot.2

3. Save BIOS and reboot system. The BIOS will show "Checking Media Presence.....", if system is not connected PXE server, it will show "No Media Present....."

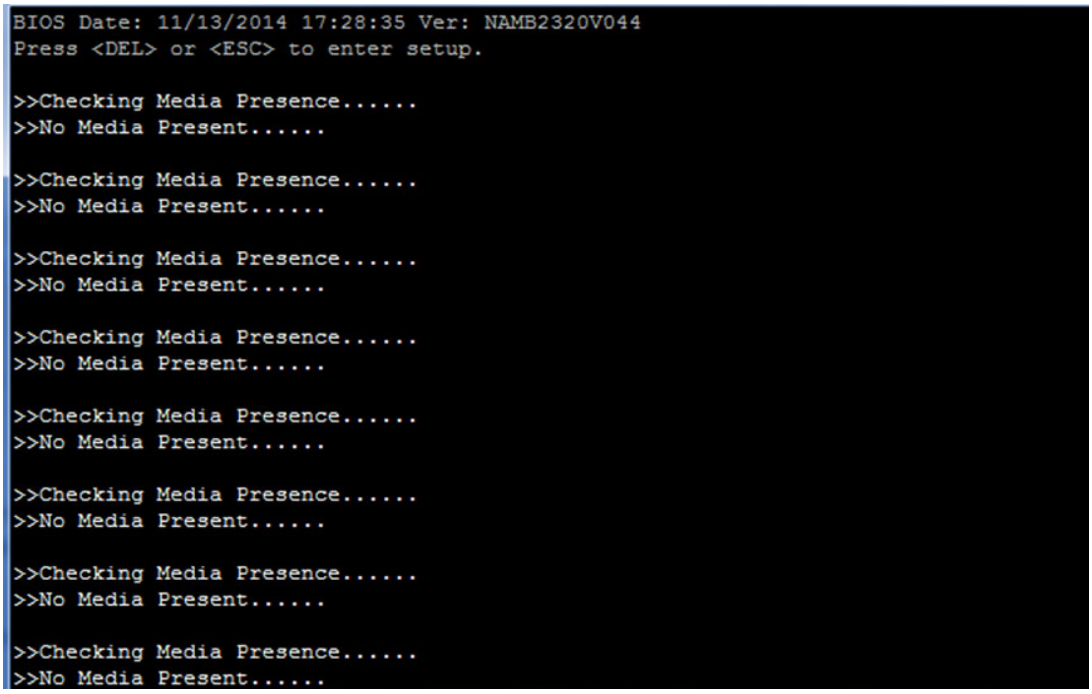


Figure 2.3 Enable PXE boot_3

4. User may re-login in BIOS, choose BIOS/ boot item, it will has "Network Device BBS Priorities" item and set UEFI PXE LAN boot sequence priority.

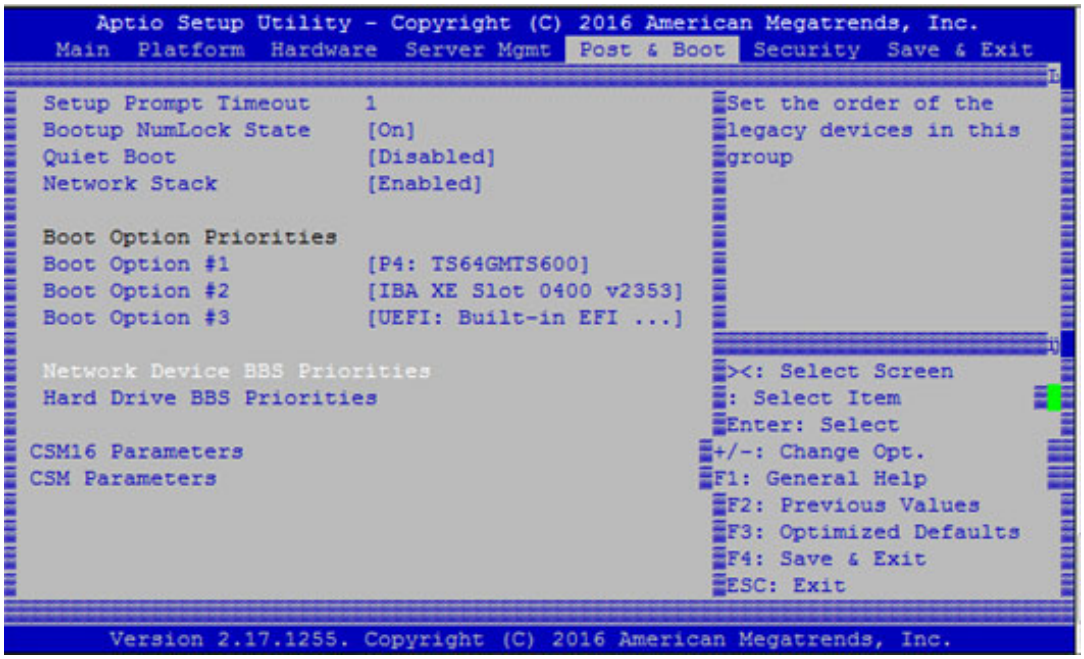


Figure 2.4 Enable PXE boot_4

And please choose PXE Boot priority as "IBA GE Slot 0A00 v1570" it is on board Mgmt GbE port.

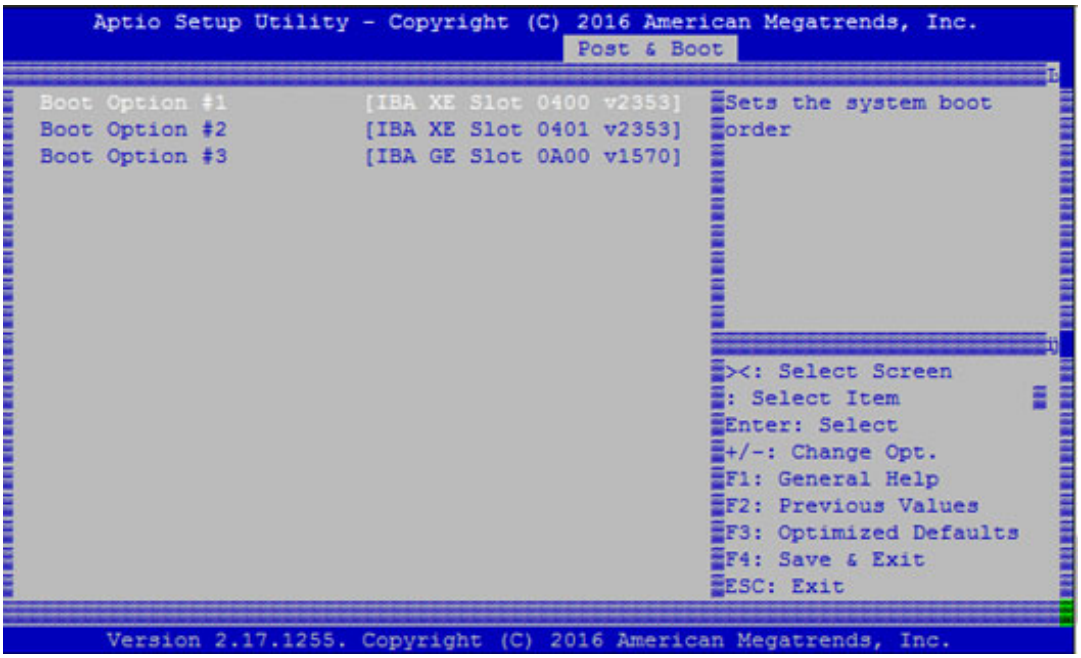


Figure 2.5 Enable PXE boot_5

PXE boot usually does not allow for OS installation over network as the PXE client will only load a single file from the boot server. Similarly, booting Linux over network is usually a two stage process. In the first step, a boot loader such a grub or mini OS such as SysLinux are loaded via PXE from the boot server. The boot loader or miniOS then load the actual target OS which usually consists of multiple files which decompressed and installed into a RAM disk. The detailed process and required configuration of such network install will heavily depend on the target OS and boot loader / miniOS used. Please refer to the related documentation available.

PXE boot requires a DHCP server and a TFTP server in the network to complete. DHCP Server and TFTP server are commonly run on the same machine and collectively referred to as "boot server". Setting up such a boot server implies a couple of steps. How-to guides for setting up Linux as PXE boot server are available on the internet, e.g. https://www.debianadministration.org/article/478/Setting_up_a_server_for_PXE_network_booting.

Warning! *Please note that it is recommended to setup a separate network / subnet for network booting as the DHCP required for PXE booting may conflict with existing DHCP servers in your network.*

2.3 LED Behaviour

2.3.1 POWER LED INDICATION

Table 2.2: Power LED Indication

+5V	LED Behavior (Green)
on	Turn on
off	Turn off

2.3.2 STORAGE LED INDICATION

Table 2.3: Storage LED Indication

SATA command	LED Behavior (Amber)
Active	Turn on
Tri-stated	Turn off

2.3.3 WWAN (LTE) LED INDICATION

Table 2.4: WWAN(LTE) LED Indication

Module Status	LED Behavior (Green)
RF function ON	Turn on
RF function OFF	Turn off

2.3.4 WLAN (WIFI) LED INDICATION

Table 2.5: WLAN(WIFI) LED Indication

Interpretation	LED Behavior (Green)
Radio is incapable of transmitting. This state is indicated when the card is not powered, the W_Disable# signal is asserted to disable the radio, or when the radio is disabled by software.	Turn off
Radio is capable of transmitting. The LED should remain ON even if the radio is bit actually transmitting. For example, the LED remains ON during temporary radio disablements performed by the Mini Card of its own volition to do scanning, switching radios/bands, power-management, etc. If the card is in a state wherein it is possible that radio can begin transmitting without the system user performing any action, this LED should remain ON.	Turn on

Note! *Duo to the WLAN (WIFI) LED Indication is output from M.2 Module directly, the default LED behaviour are shown below when there is no additional driver to set LED output*

1. WLAN (WIFI) LED behavior in Linux
   Description:
   LED default is off
2. WLAN (WIFI) LED behavior in Win10 (For Module W163 only, W162 is not supported in Win10)
   Description:
   LED remain on but off if AC on.
   LED remain on if no data transmitting.

2.3.5 SOFTWARE DEFINABLE LED INDICATION

Table 2.6: Software Definable LED Indication

Definition	LED Behavior (Green/Red)
TBD by Customer	Turn off
TBD by Customer	Turn on (Red)
TBD by Customer	Turn on (Green)
TBD by Customer	Turn on (Red and Green)

2.4 Main Board Connector placement

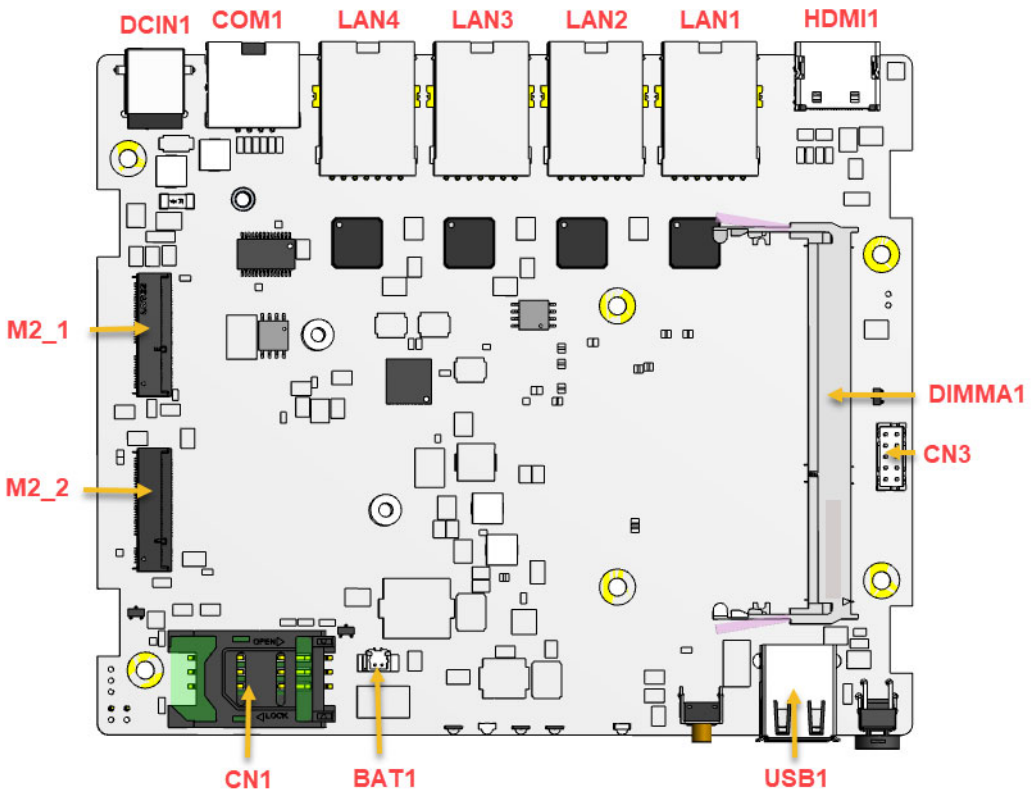


Figure 2.6 Board Placement Diagram (Top)

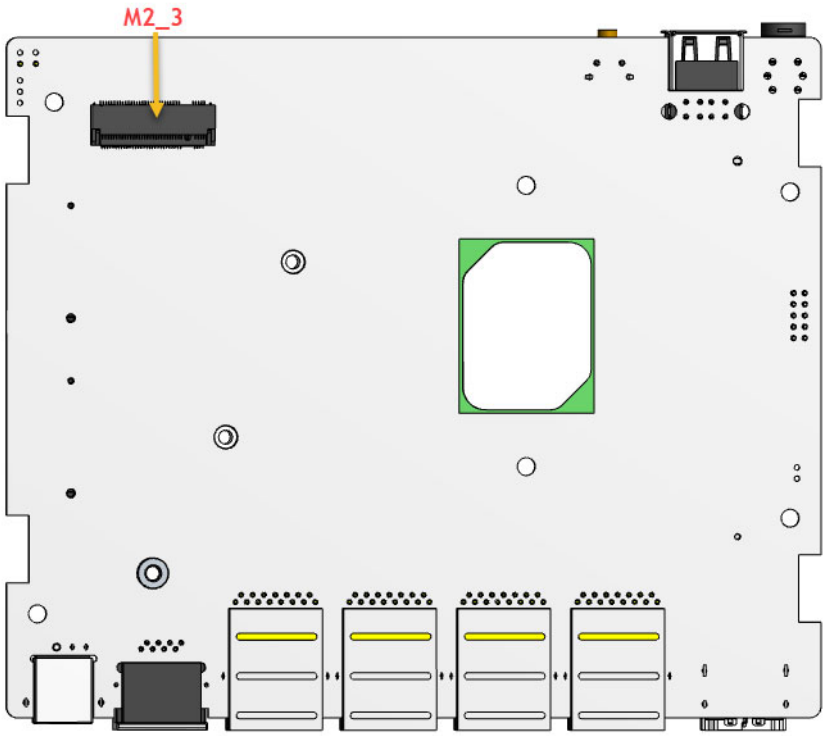


Figure 2.7 Board Placement Diagram (Bottom)

Table 2.7: FWA-T011 Connector

Location	Description
DCIN1	Power Connector (+12V to MB)
COM1	Console Connector
LAN1	LAN Connector
LAN2	LAN Connector
LAN3	LAN Connector
LAN4	LAN Connector
HDMI1	HDMI Connector
M2_1	M.2 KEY E Connector (WIFI)
M2_2	M.2 KEY B Connector (LTE)
M2_3	M.2 KEY M Connector (Storage)
DIMMA1	DDR3L SODIMM Connector
CN1	SIM CARD Connector
CN3	Debug Connector
USB1	2 Ports USB2.0 Connector
BAT1	Battery Connector

Chapter 3

BIOS

FWA-T011 BIOS is based on AMI's APTIO BIOS and compliant to the UEFI, SMBIOS and ACPI specifications.

The BIOS performs probing, initialization and configuration of the FWA-T011 and initializes the OS boot process at the end of POST (Power-On-Self-Test).

Regular BIOS output as well as the setup menu are displayed via console port and please note that the FWA-T011 does not have any on-board POST Code LEDs. A special POST code adapter is required to retrieve BIOS error codes.

All BIOS configuration parameters bare stored in NVRAM, a dedicated section of the BIOS flash chip. Parameters are no longer stored in legacy CMOS RAM by the platform BIOS. I.e. BIOS configuration parameters will not be lost due to an empty battery.

3.1 BIOS Defaults

The BIOS comes with a set of configuration parameters when shipped by Advantech referred to as "Optimized Defaults" or "factory defaults". The user can change BIOS settings via the setup menu either temporarily or permanently by saving the changes as "User defaults".

The BIOS loads Optimized Defaults by the option "Restore Defaults; and loads User defaults by the option "Restore User Defaults". If no User defaults have been defined, the BIOS will do nothing.

3.1.1 BIOS SETUP MENU

This section describes the FWA-T011's UEFI BIOS based on AMI's APTIO BIOS.

Users can modify BIOS settings and control the special features of the FWA-T011 using the BIOS setup menu.

Please note that Advantech supports shipping the FWA-T011 with custom BIOS defaults to simplify the deployment and integration for our customers. Please contact your Advantech representative if you want to receive more information regarding this service.

The BIOS Setup Menu can be entered via the BIOS POST screen displayed on the console interface:



Figure 3.1 BIOS POST screen (by using other model as an example)

BIOS Setup can be entered by hitting <DEL> or <F2> keys during POST.

The BIOS setup menu screens have a few main elements as shown below. The menu bar displays the selectable menu pages as tabs. The parameter window displays and allows configuration of the settings available in a given menu page or a submenu thereof. Auxiliary text providing information about the selected setup item is displayed in the top right corner.

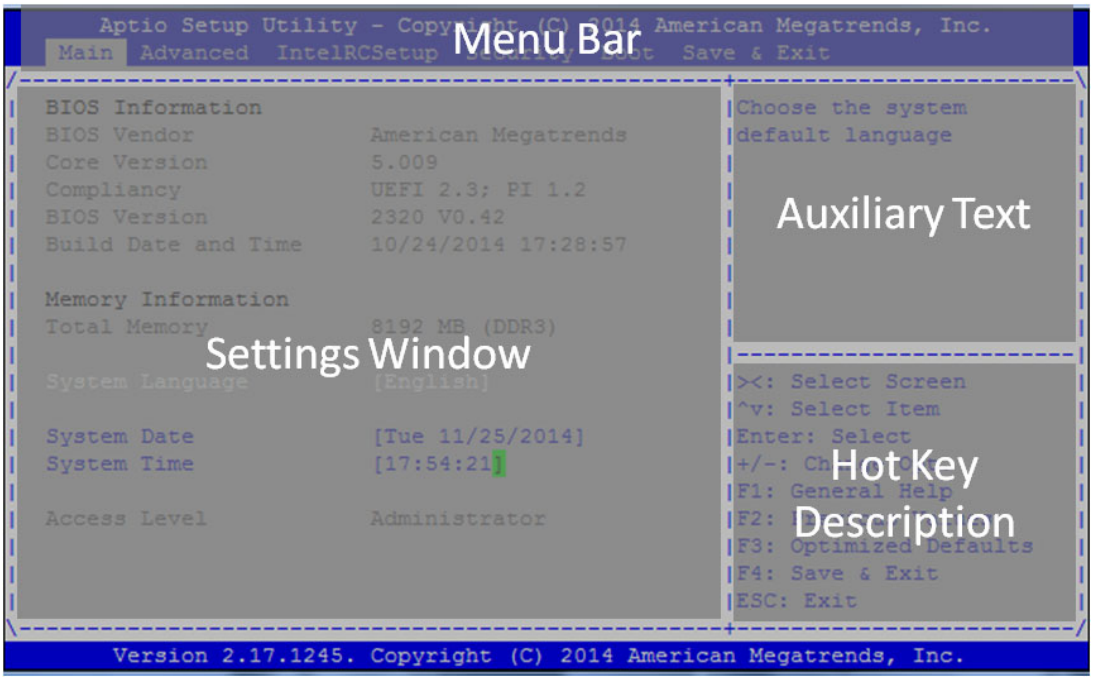


Figure 3.2 BIOS Setup Screen Organization

3.1.2 MAIN SETUP MENU

If security protection has been enabled previously, you will be prompted for the BIOS password upon entering the BIOS Setup. After a successful check or if password protection has not been enabled, users will see the Main Setup screen shown below. Users can always return to the Main setup screen by selecting the Main tab.

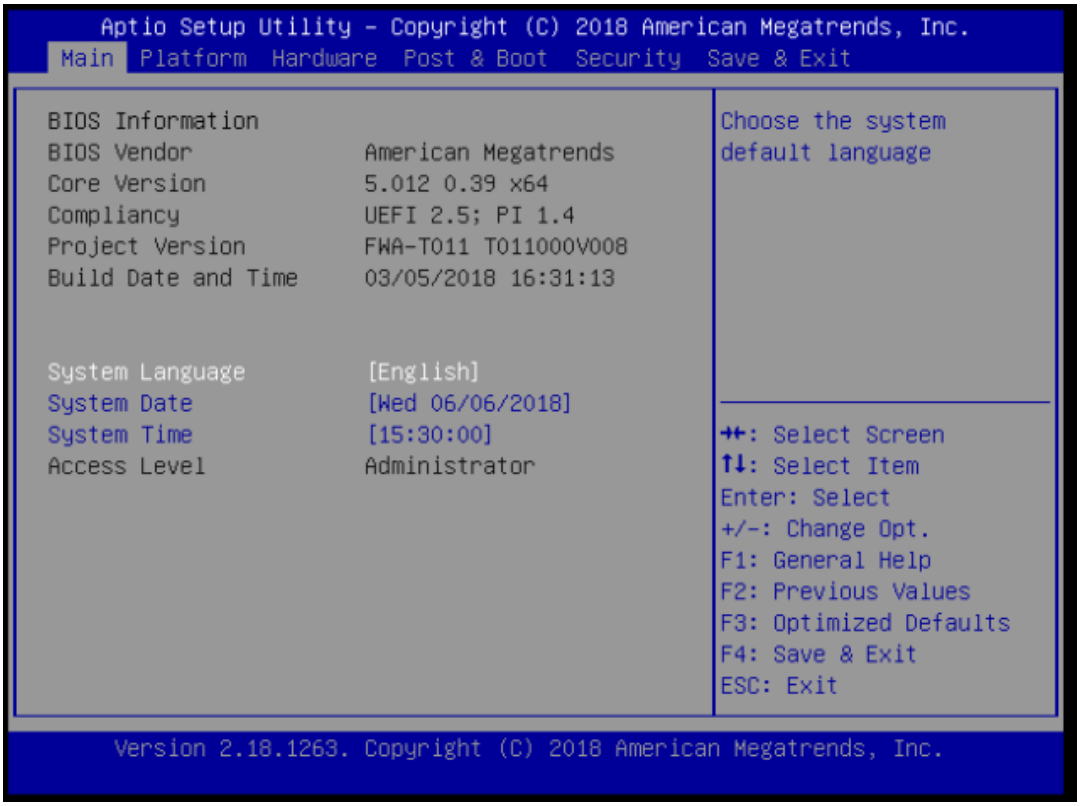


Figure 3.3 BIOS Setup Main screen

The main setup page displays system a summary of system and BIOS configuration and status information. The fields on this page are read-only except for the System Date and Time setting.

Table 3.1: BIOS Setup: Main Menu

Group	Setup item	Access / Options	Description
BIOS Information	BIOS Vendor	Display only	American Megatrends
	Core Version	Display only	Current AMI BIOS core version in use
	Compliancy	Display only	UEFI Spec revision that the BIOS complies to
	Project Version	Display only	Advantech BIOS Version info EX: mmmm Vx.yz mmmm: model name X: major version Yz: minor version
	Build Date & Time	Display only	Shows BIOS build date and time
	NVRAM Version	Display only	Shows current NVRAM ver.
	System Language	Display only	Selects the Setup Menu Language. Only English is supported on the FWA-T011.
	System Date	MM/DD/YY	Displays and sets the system date as used by the BIOS
	System Time	HH:MM:SS	Displays and sets the system time as used by the BIOS
	Access Level	Display only	Shows the user privilege level according to the security settings. If password protection has not been enabled, this will default to "Administrator"

3.1.3 SETTING SYSTEM TIME AND DATE

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.

Please note that system time and date are set during manufacturing process according to factory's local time zone. You may need to update system time to reflect the desired time zone when you receive the unit.

3.1.4 PLATFORM SETUP MENU

Select the Platform tab from the FWA-T011 setup screen to enter the Platform Setup screen. Users can select any of the items in the left frame of the screen, such as the Trusted Computing Configuration, to go to the sub menu for that item. Users can display a Platform BIOS Setup option by highlighting it using the <Arrow> keys. The Platform BIOS Setup screen is shown below. The sub menus are described on the following pages. Note: If BMC is Present in the system and Hardware Monitor page will be hidden.

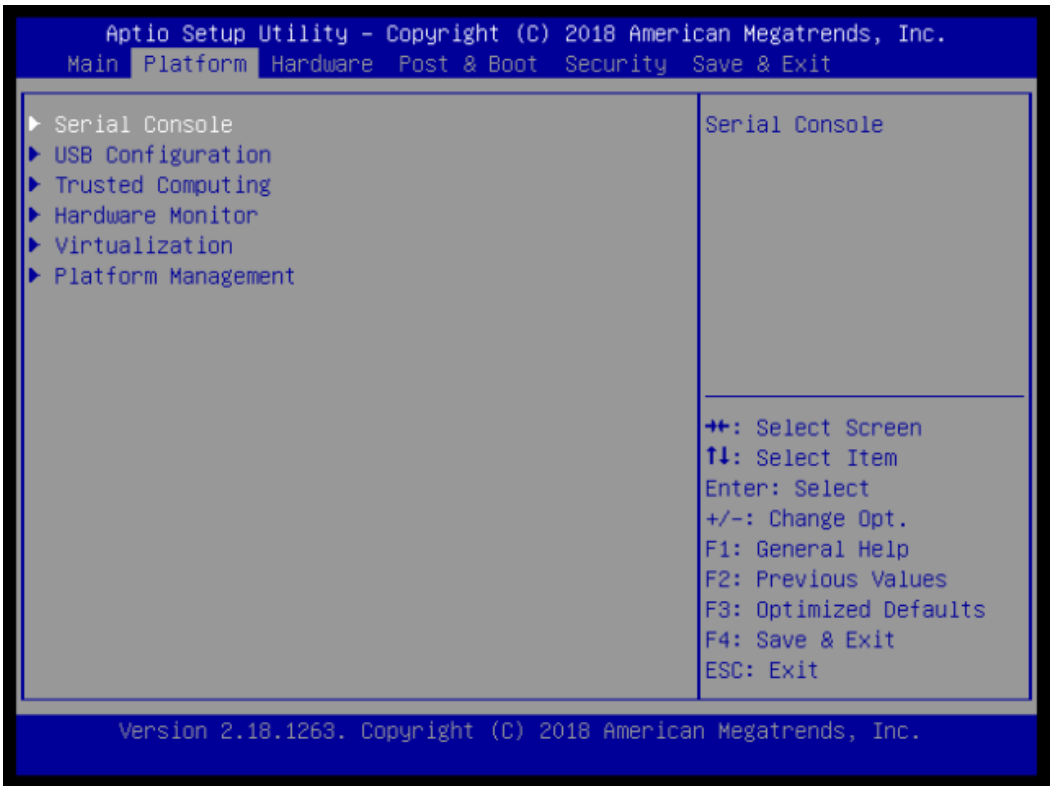


Figure 3.4 Platform Setup Main screen

3.1.4.1 Serial Console

This sub menu allows you to change the settings used for the serial console.

Note that the serial console is always using COM1 which is connected to the front panel.

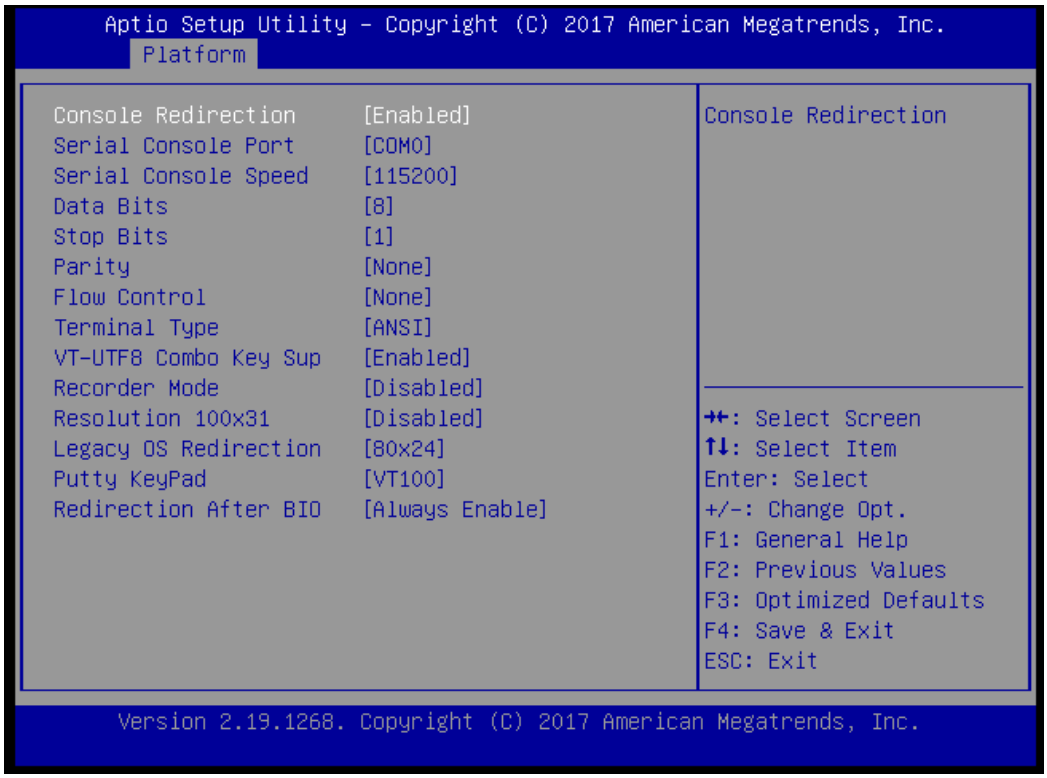


Figure 3.5 Platform Setup_Console Redirection Menu

The settings for COM0 console can be accessed in this menu.

This sub menu allows you to change the settings used for the serial console. For example, users can define the terminal type, bits per second, data bits, parity, stop bits and others.

Table 3.2: Platform Setup: COM0 Console Redirection Menu Items

Setup item	Access / Options	Description
Console Redirection	Disabled /Enabled	Disabled / Enabled Console Redirection
Serial Console Port	COM0	Serial Console Port
Terminal Type	ANSI / VT100 / VT100+ /VT-UTF8	Select the target terminal emulation type: ■ ANSI to use the Extended ASCII Character Set. ■ VT100 to use the ASCII Character set. ■ VT100+ to add color and function key support. ■ VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes.
Serial Console Speed	9600 / 19200 / 38400 / 57600 / 115200	Defines the baud rate.
Data Bits	7 / 8	Defines number of data bits in a character.
Parity	None / Even / Odd / Mark / Space	Defines the parity scheme used.
Stop Bits	1 / 2	Defines number of stop bits in a character.
Flow Control	None / Xon/Xoff	Defines the flow control scheme.
VT-UF8 Combo Key	Disabled /Enabled	Enables VT-UTF8 Combination Key Support for ANSI / VT100 terminals
Recorder Mode	Disabled /Enabled	When Enabled the data displayed on a terminal will be captured and sent as text messages to a remote server.
Resolution 100x31	Disabled /Enabled	Enables or disables extended terminal resolution
Legacy OS redirection	80x24 /80x 25	When using Legacy OS, this item specifies the Number of Rows and Columns supported
PuTTY Keypad	VT100 /. LINUX / XTERMR6 / SCO / ESCN / VT400	Select Function Key and Key Pad Emulation on PuTTY.
Redirection after BIOS	Always Enable / BootLoader	This defines how long console redirection will be active: "BootLoader" means that legacy console redirection is disabled before booting into a Legacy OS. "Always Enable" means Legacy console Redirection is enabled permanently.

3.1.4.2 USB Configuration

This sub menu allows you to change the settings used for USB and to get an overview of the USB devices detected by the BIOS.

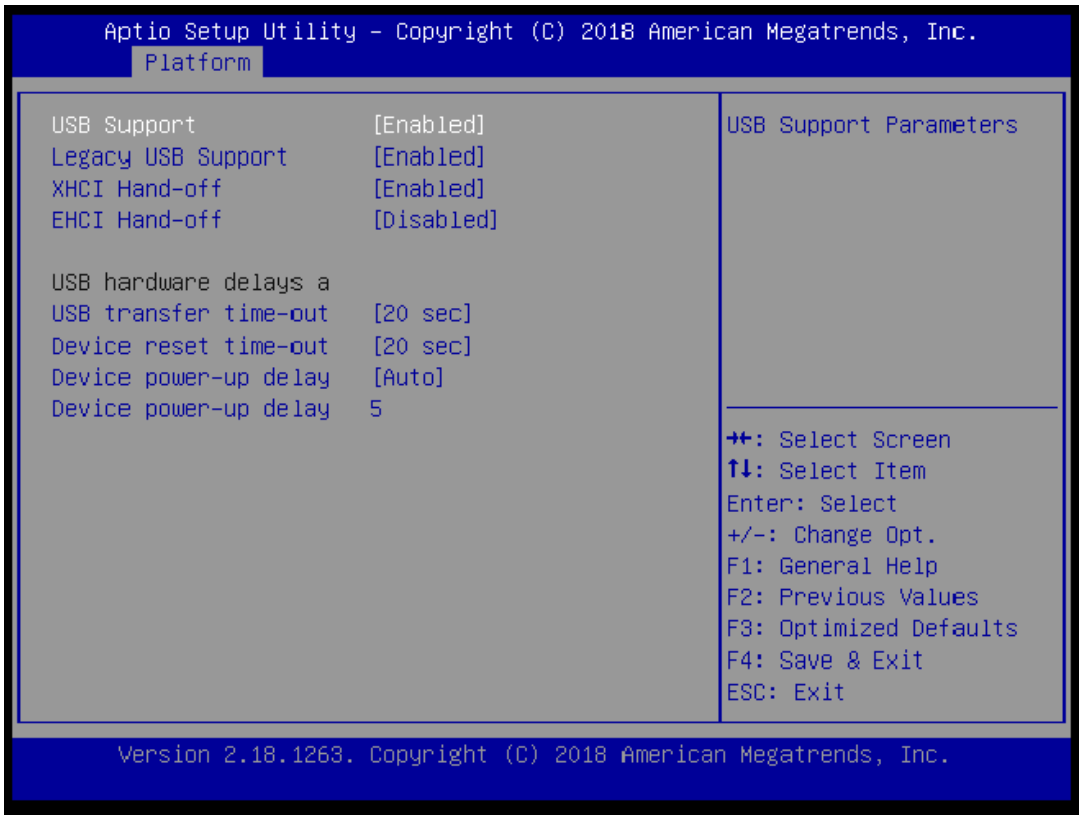


Figure 3.6 Platform Setup_USB Configuration Menu

Table 3.3: USB Configuration Menu

Group	Setup item	Access / Options	Description
None	USB Support	Enabled Disabled	Enables or disables the support for USB. If disabled, the USB EHCI controller will not be initialized by the BIOS.
	Legacy USB Support	Auto Enabled Disabled	Enables legacy support over USB to support Keyboard and Mouse
	XHCI Hand-Off	Enabled Disabled	Controls the hand off of XHCI ownership from BIOS to OS at boot time.
	EHCI Hand-Off	Enabled Disabled	Controls the hand off of EHCI ownership from BIOS to OS at boot time.
USB hardware delay	USB transfer time-out	1sec / 5sec / 10sec / 20sec	The time-out value for Control, Bulk, and Interrupt transfers.
	Device Reset time-out	10sec / 20sec / 30sec / 40sec	Time Out for a device to Reset
	Device power-up delay	Auto Manual	Maximum time the device will take before it properly reports itself to the Host Controller.
	Device power-up delay	5	

3.1.4.3 Trusted Computing

Please note that Trusted Computing support is disabled by default in the factory defaults to save system boot time. If disabled, the Trusted Computing Menu will not display any status information.

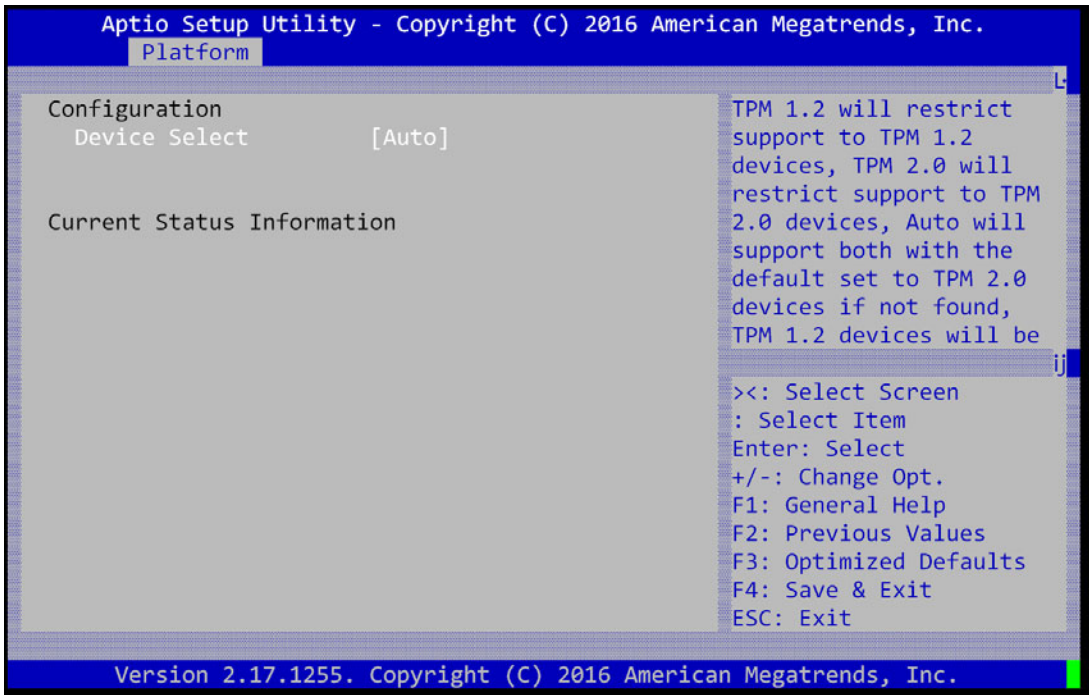


Figure 3.7 Platform Setup_Trusted Computing

Table 3.4: Trusted Computing Menu

Group	Setup item	Access / Options	Description
Configuration	Security Device Sup	Auto TPM1.2 TPM2.0	Auto will support both or set the support for the TPM 1.2 or TPM2.0.
Current Status information	Support Turned Off	Display Only	Is displayed when TPM support is disabled
	TPM State	Display Only	Shows TPM Enablement Status
	TPM Active State	Display Only	Shows TPM Activation Status
	TPM Owner	Display Only	Shows Current TPM Owner

3.1.4.4 Trusted Computing with TPM module installed

When system with TPM2.0 module installed, and the BIOS will auto detect it and the related setting will be shown in the BIOS setup menu as below.

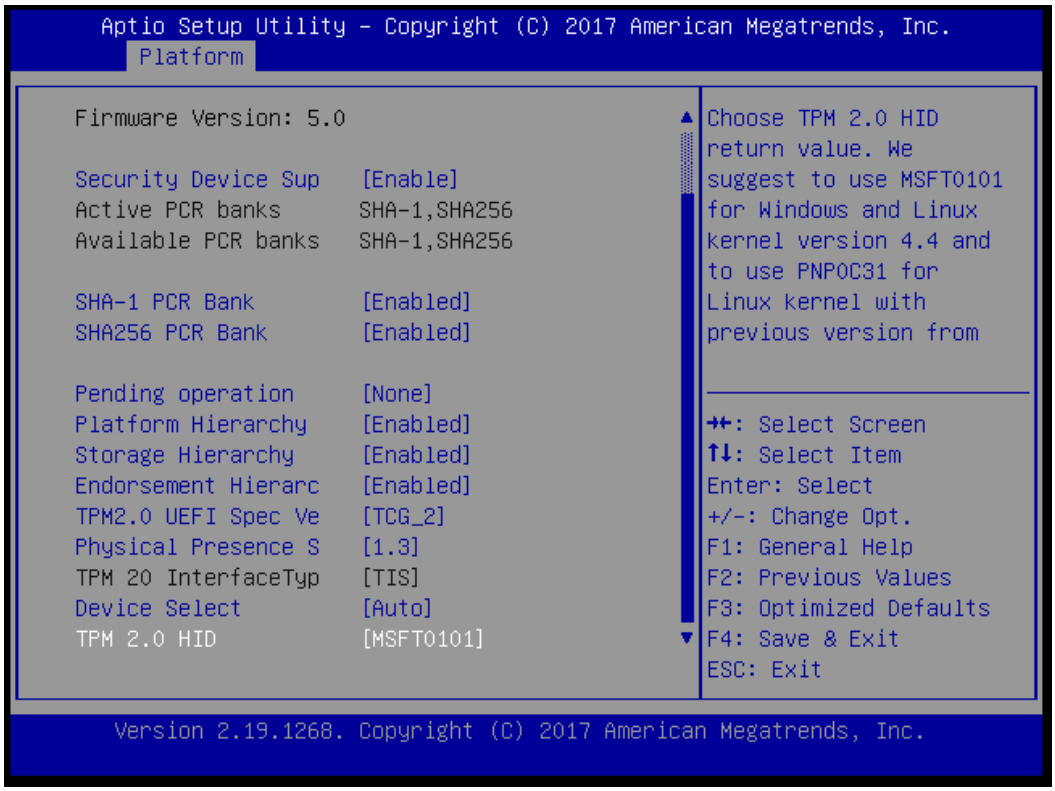


Figure 3.8 Platform Setup_Trusted Computing with TPM2.0

Table 3.5: Trusted Computing Menu with TPM2.0

Group	Setup item	Access / Options	Description
TPM20 Device Found	Security Device Sup	Enable Disable	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	Enable Disable	Enable/Disable SHA-1 PCR Bank
	SHA256 PCR Bank	Enable Disable	Enable/Disable SHA256 PCR Bank
	Pending operation	None 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	Enable Disable	Enable or Disable Platform Hierarchy
	Storage Hierarchy	Enable Disable	Enable or Disable Storage Hierarchy
	Endorsement Hierarchy	Enable Disable	Enable or Disable Endorsement Hierarchy
	TPM2.0 UEFI Spec Version	TCG_2 TCG_1_2	Select the TCG2 Spec Version Support TCG_1_2: the Compatible mode for Win8/Win10 TCG_2: Support new TCG2 protocol and event format for Win10 or later
	Physical Presence Spec Version	1.2 1.3	Select to Tell O.S. to support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3
	TPM 20 InterfaceTyp	Display only (TIS)	
	Device Select	Auto	Auto will support both or set the support for the TPM 1.2 or TPM2.0.
	TPM 2.0 HID	MSFT0101 PNP0C31	Choose TPM 2.0 HID return value. We suggest to use MSFT0101 for Windows and Linux kernel version 4.4 and to use PNP0C31 for Linux kernel with previous version from 4.4

When system with TPM1.2 module installed, and the BIOS will auto detect it and the related setting will be shown in the BIOS setup menu as below.

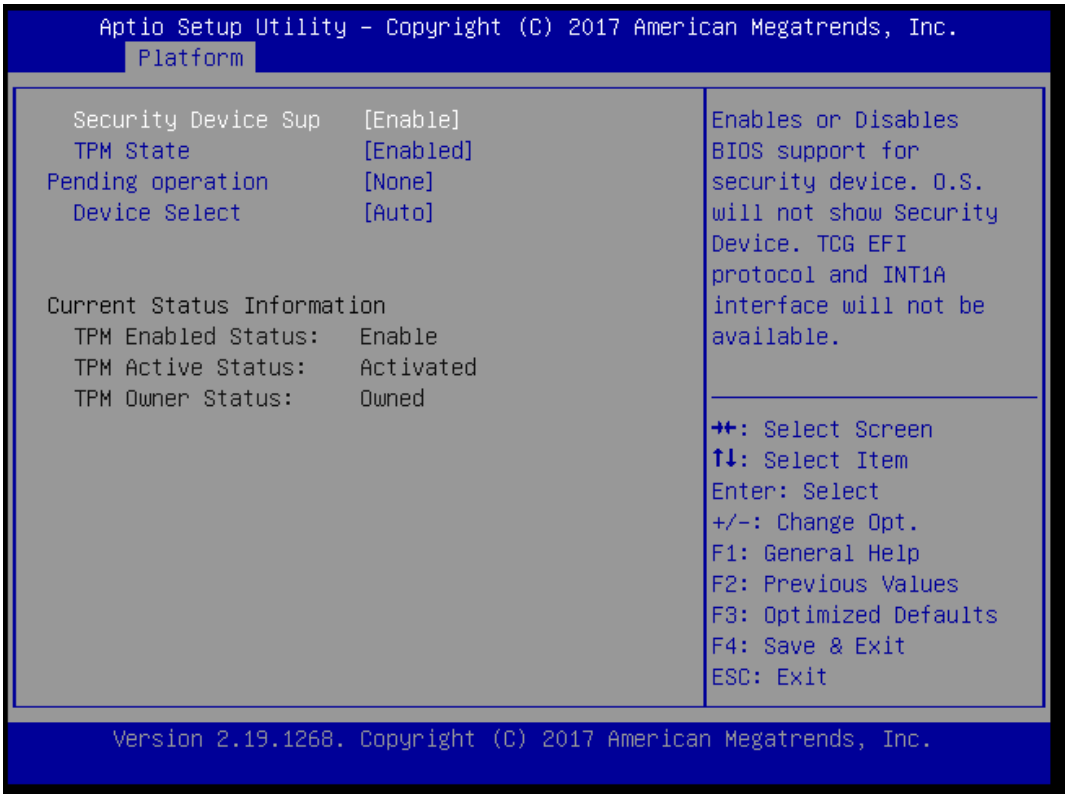


Figure 3.9 Platform Setup_Trusted Computing with TPM1.2

Table 3.6: Trusted Computing Menu with TPM1.2

Group	Setup item	Access / Options	Description
TPM1.2 Device Found	Security Device Sup	Enable Disable	BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
	TPM State	Enable Disable	Enable/Disable Security Device. NOTE: Your Computer will reboot during restart in order to change State of the Device.
	Pending operation	None	Schedule an Operation for the Security Device. NOTE: Your Computer will reboot during restart in order to change State of Security Device.
	Device Select	Auto	Auto will support both or set the support for the TPM 1.2 or TPM2.0.

3.1.4.5 H/W Monitor

This sub menu allows you to see all the H/W monitor items detected by the BIOS for well know the current system health status.

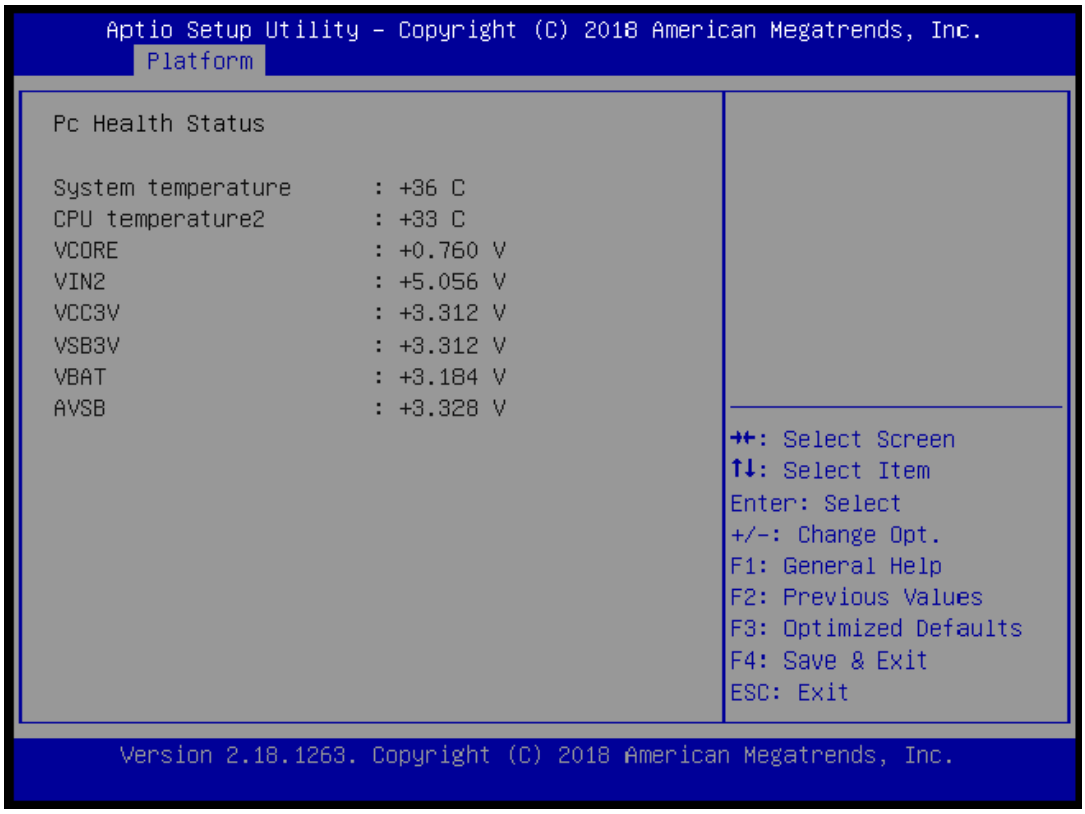


Figure 3.10 Platform Setup_HW monitor

3.1.4.6 Virtualization

This sub menu allows you to change the settings used for Virtualization function.

Intel® Virtualization Technology for Directed I/O (VT-d). Thus, BIOS handle virtual functions exposed by PCIe devices in case SR-IOV is supported, otherwise PCIe devices will be assigned to virtual machines in pass-through mode. This applies for all PCIe devices.

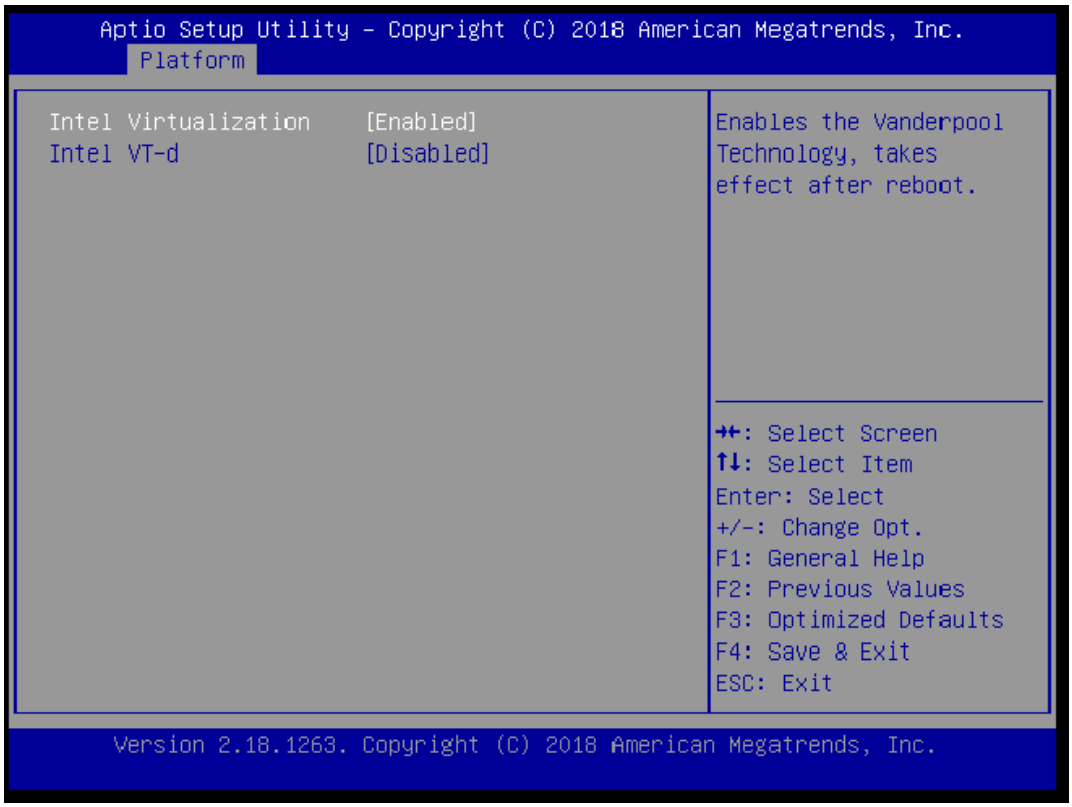


Figure 3.11 Platform Setup_Virtualization

Table 3.7: Virtualization Menu

Group	Setup item	Access / Options	Description
None	Intel Virtualization	Enable Disable	Enable/Disable Intel Virtualization Technology , take effect after reboot
	Intel VT-d	Enable Disable	Enable/disable Intel Virtualization Technology for Directed I/O (VT-d) by reporting the I/O device

3.1.4.7 Platform Management

This sub menu allows you to change the settings used for related CPU utilization setting.

The default configuration for CPU was optimized setting for getting better performance for networking, so it is not recommend to change it.

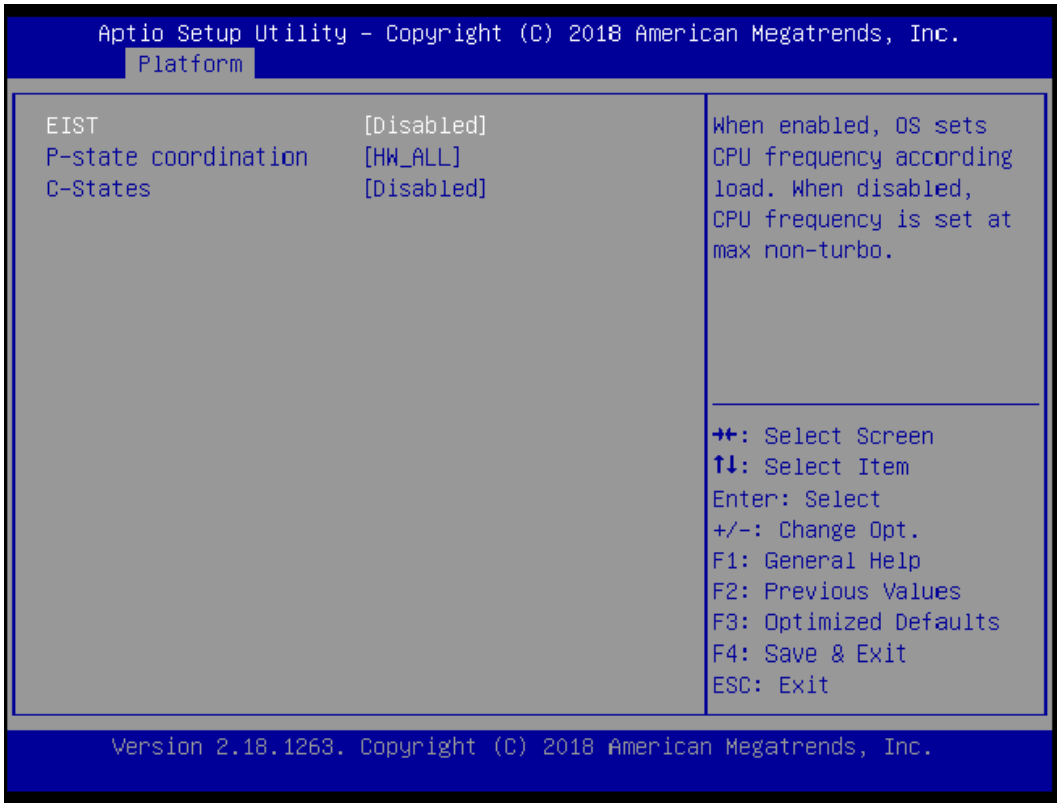


Figure 3.12 Platform Setup_Platform Management

Table 3.8: Platform Management Menu

Group	Setup item	Access / Options	Description
None	EIST	Enable Disable	Enable or disable BIOS support for Enhanced Intel SpeedStep Technology, When enabled, OS sets CPU frequency according load. When disabled, CPU frequency is set at max non-turbo.
	Turbo Mode	Enable Disable	Turbo mode allows a CPU logical processor to execute a higher frequency when enough power is available not exceed CPU defined limits
	P-state coordination	HW_ALL	HW_ALL (hardware) coordination is recommended over SW_ALL and SW_ANY (software coordination).
	C-states	Enable Disable	Enable/Disable CPU C6(ACPI C2) report to OS Recommended to be enabled.
	Max Package C State	C2 state C1 state C0 state	Maximum Package C State support. The "waking-up time" will be longer if Package C state setting is deep C state support.

3.1.5 HARDWARE SETUP MENU

This sub menu allows you to change the settings of the Intel chipset. Please note that "chipset" is a legacy term and the related functionality is split over the CPU and PCH portions of the SoC. Similarly, the terms "South Bridge" and "North Bridge" are legacy terms and do not represent the silicon implementation any more. However, those terms are kept consistent with previous products to allow users to navigate more easily. The sub menus are described on the following pages.

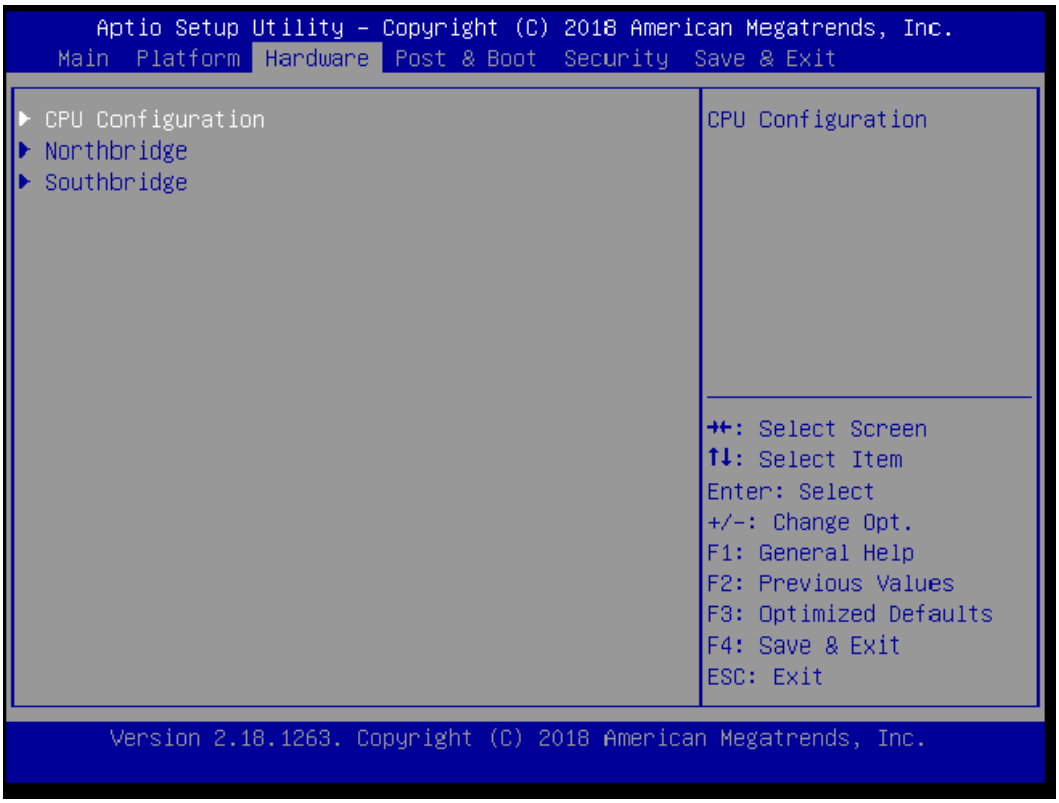


Figure 3.13 Hardware Configuration Menu

3.1.5.1 Hardware Setup: CPU Configuration

This menu uses example of Atom CPU configuration.

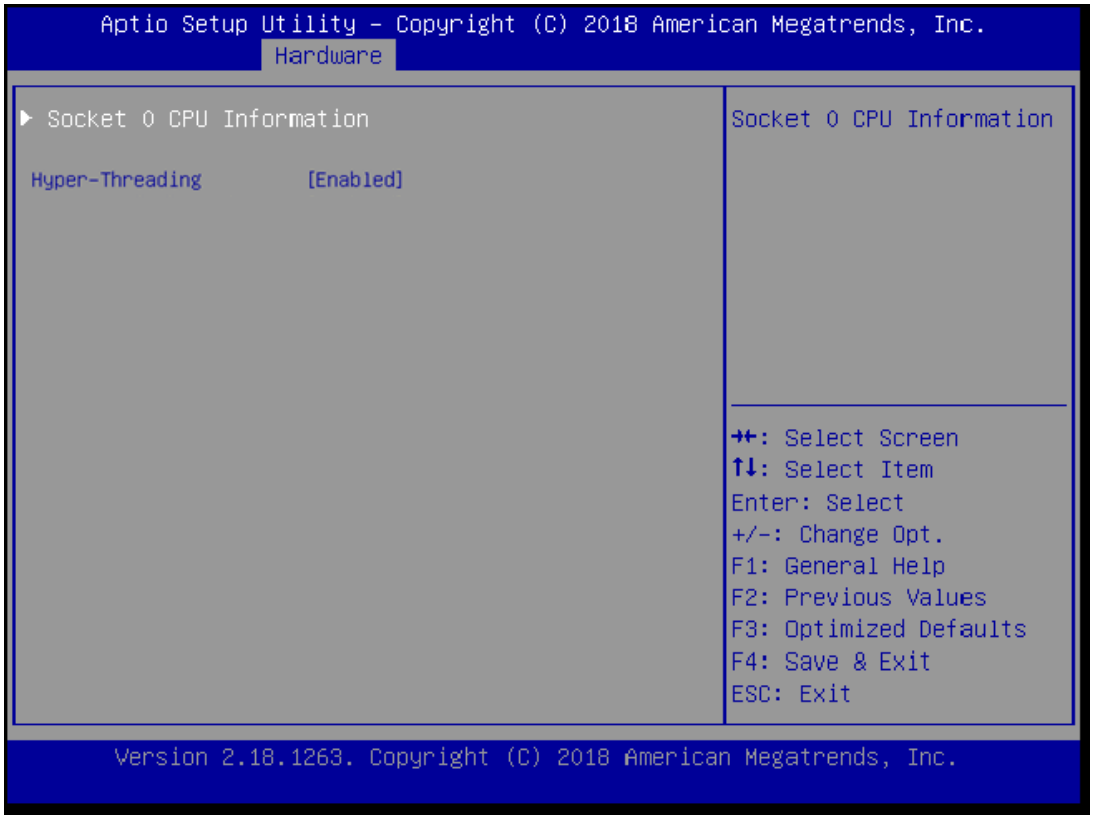


Figure 3.14 Chipset_Processor Configuration Menu

Table 3.9: Processor Configuration Menu

Group	Setup item	Access / Options	Description
Socket0 CPU information	CPU signature	Display only	Displays information on the processor installed
	Microcode Patch		
	CPU Frequency		
	Processor Cores		
	Intel VT-x Technology		
	L1 code Cache		
	L2 Cache		
	L3 Cache		
	Intel HT Technology		
None	Hyper-threading	Enable Disable	Enables Hyper Threading (Software Method to enable/disable logical processor threads.

3.1.5.2 Hardware Setup: North Bridge Configuration

This menu allows the configuration of the memory controller and related features of the SoC.

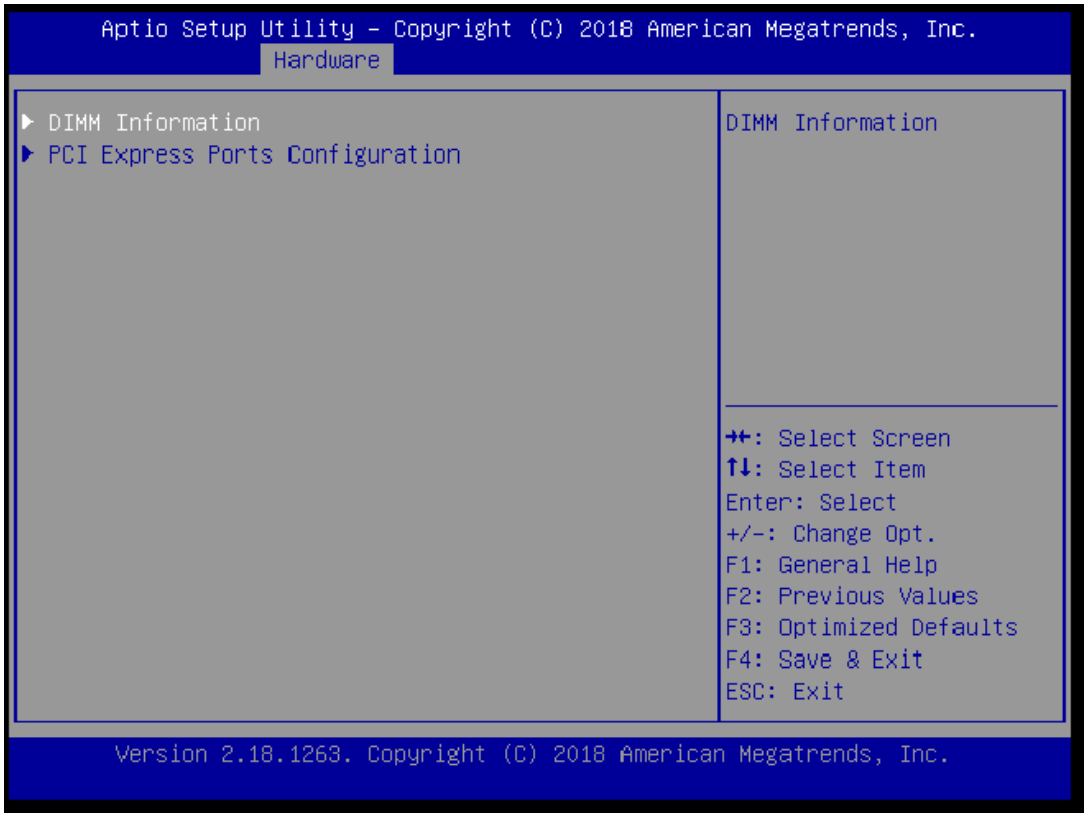


Figure 3.15 NorthBridge Configuration Menu

Table 3.10: Northbridge Configuration Menu

Group	Setup item	Access / Options	Description
DIMM Information	Total Memory	Display only	Displays information on the processor installed
	Memory Frequency		

3.1.5.3 PCI Express Port Configuration

This sub-menu contains settings for the PCIe subsystem. Some menu items are referred to as "PCI" settings. Although the FWA-T011 does not implement a PCI bus, these settings still apply to the platform as PCIe is using the same configuration mechanism as PCI.

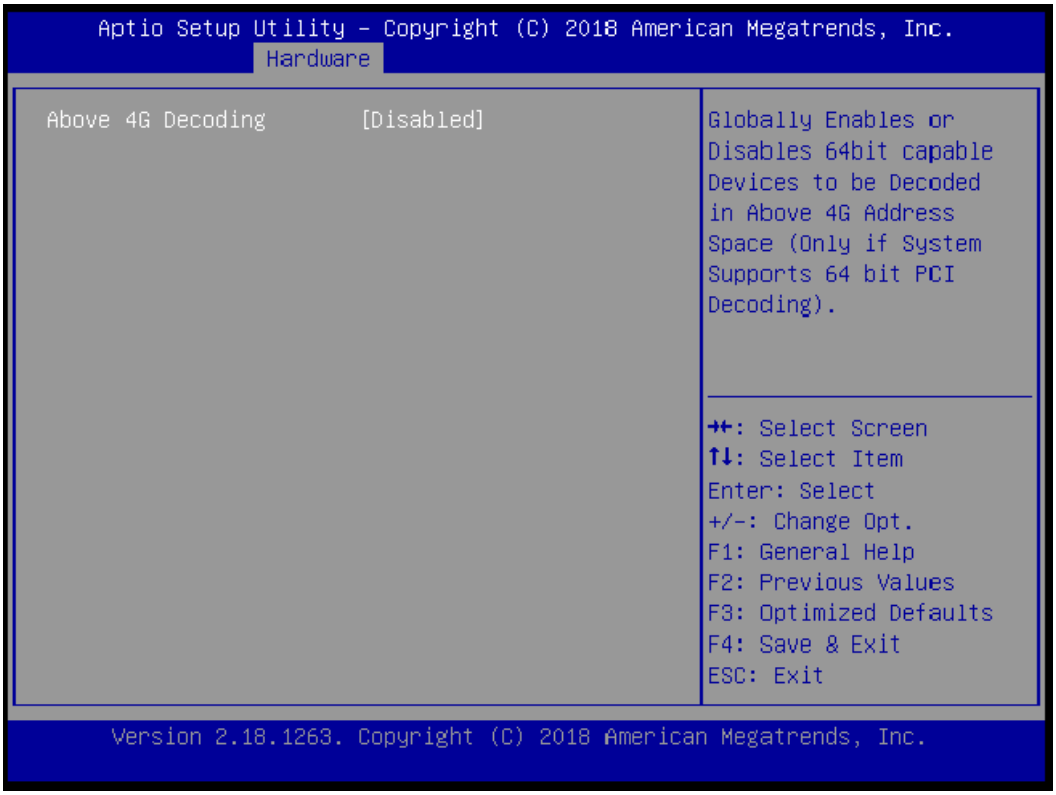


Figure 3.16 Hardware Setup_PCI Subsystem

Table 3.11: Hardware Setup: PCI Subsystem Menu Items

Group	Setup item	Access / Options	Description
Hardware	Above 4G Decoding	Enabled Disable	Enables or Disables 64bit capable Devices to be Mapped above 4GB in the Address

3.1.5.4 Hardware Setup: South Bridge Configuration

This menu contains settings for the South Bridge for related SATA and USB and ACPI setting etc.

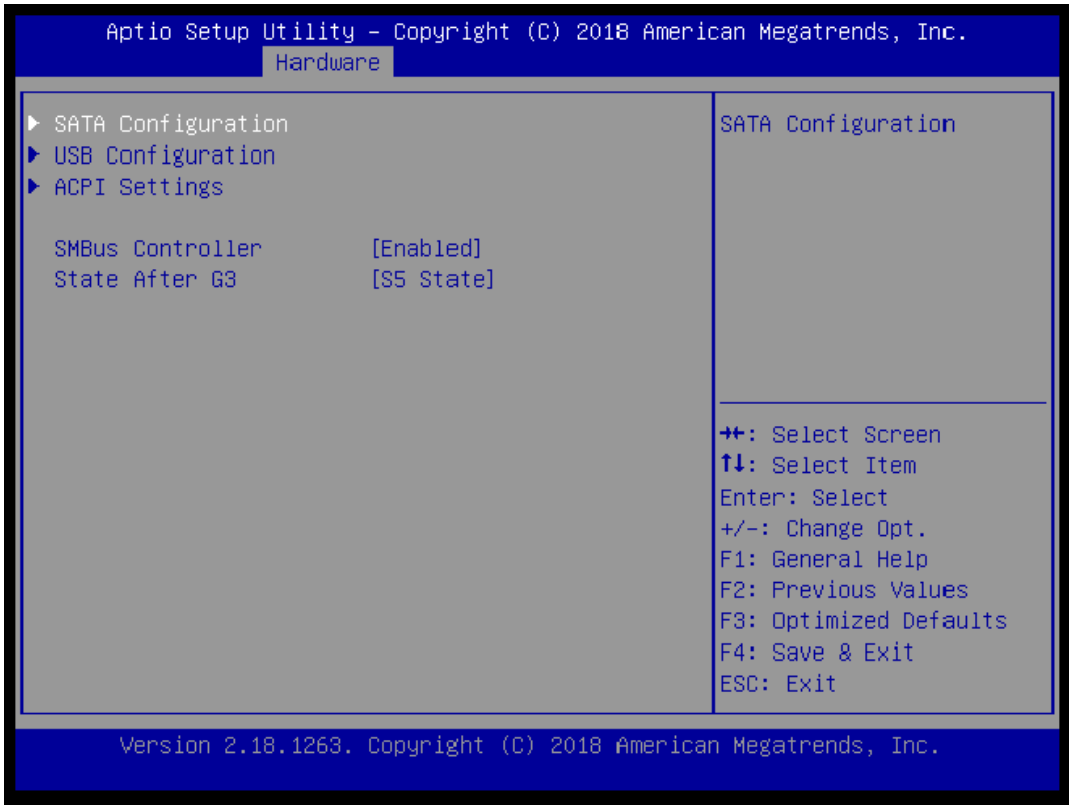


Figure 3.17 Hardware Setup_South Bridge configuration

Table 3.12: Hardware Setup: South Bridge configuration Menu Items

Group	Setup item	Access / Options	Description
	SATA Configuration	N/A	Select sub-menu.
	USB Configuration	N/A	Select sub-menu.
	ACPI Settings	N/A	Select sub-menu.
	SMBus Controller	Enable/Disable	Enable or Disable SMBus Device
	state after G3	S0 State S5 State Last State	Select S0,S5 and Last state for ACPI state after a G3

3.1.5.5 South Bridge Configuration: SATA Configuration

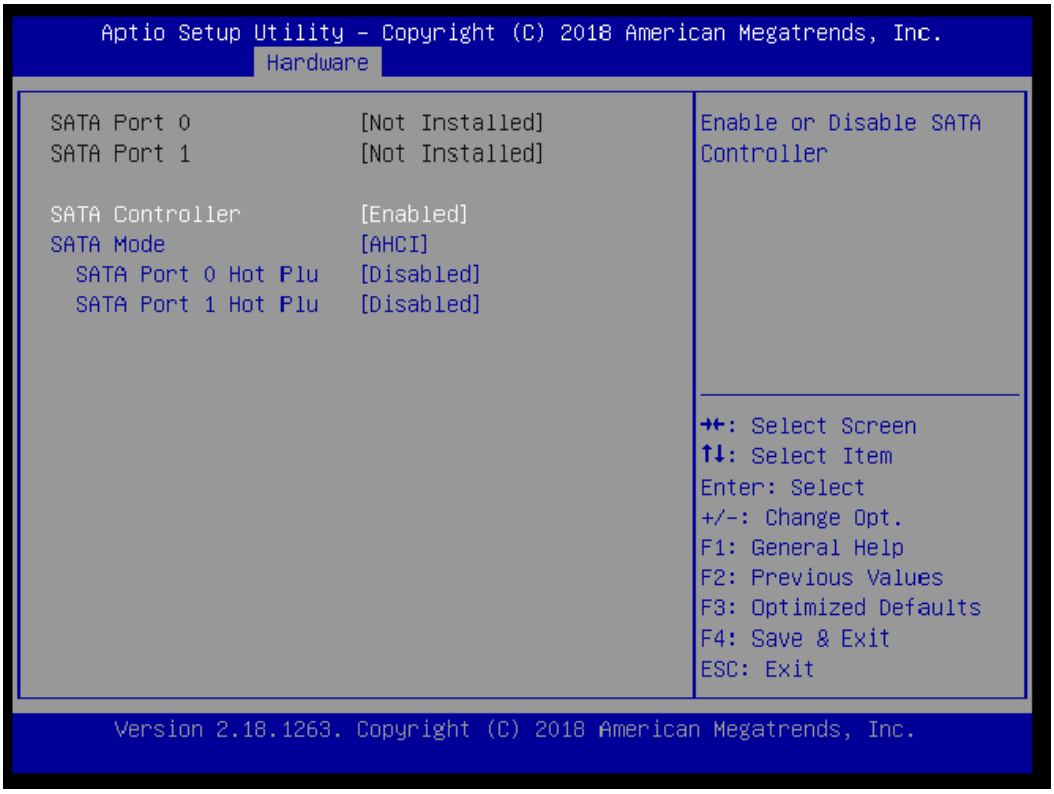


Figure 3.18 Hardware Setup_SATA configuration

Table 3.13: Hardware Setup: SATA configuration Menu Items

Feature	Default	Description
SATA Port0	Display only	Show current SATA devices in use on the FWA-T011
SATA Port1	Display only	
SATA Mode	AHCI	(1) AHCI Mode.
SATA Controller	Enabled Disabled	To enable the SATA controller
SATA Port 0 Hot Plug Capability	Enabled Disabled	Designates this port as Hot Pluggable
SATA Port 1 Hot Plug Capability	Enabled Disabled	Designates this port as Hot Pluggable

3.1.5.6 USB Configuration

This menu contains settings for the USB configuration.

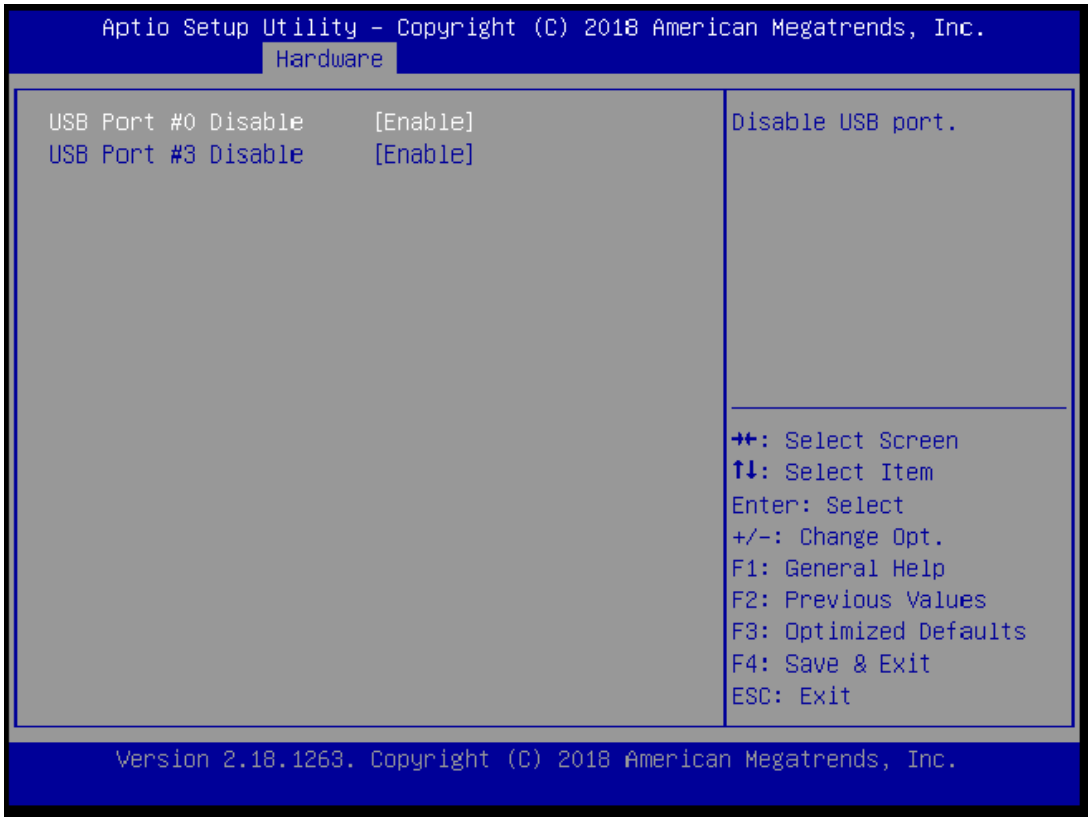


Figure 3.19 Hardware Setup_USB configuration

Table 3.14: Hardware Setup: USB configuration Menu Items

Group	Setup item	Access / Options	Description
USB Configuration	USB Port #0 Disable	Enabled Disabled	Enable/Disable this USB Physical Connector (physical port)
	USB Port #3 Disable	Enabled Disabled	Enable/Disable this USB Physical Connector (physical port)

3.1.5.7 ACPI Setting

This menu contains settings for the ACPI configuration.

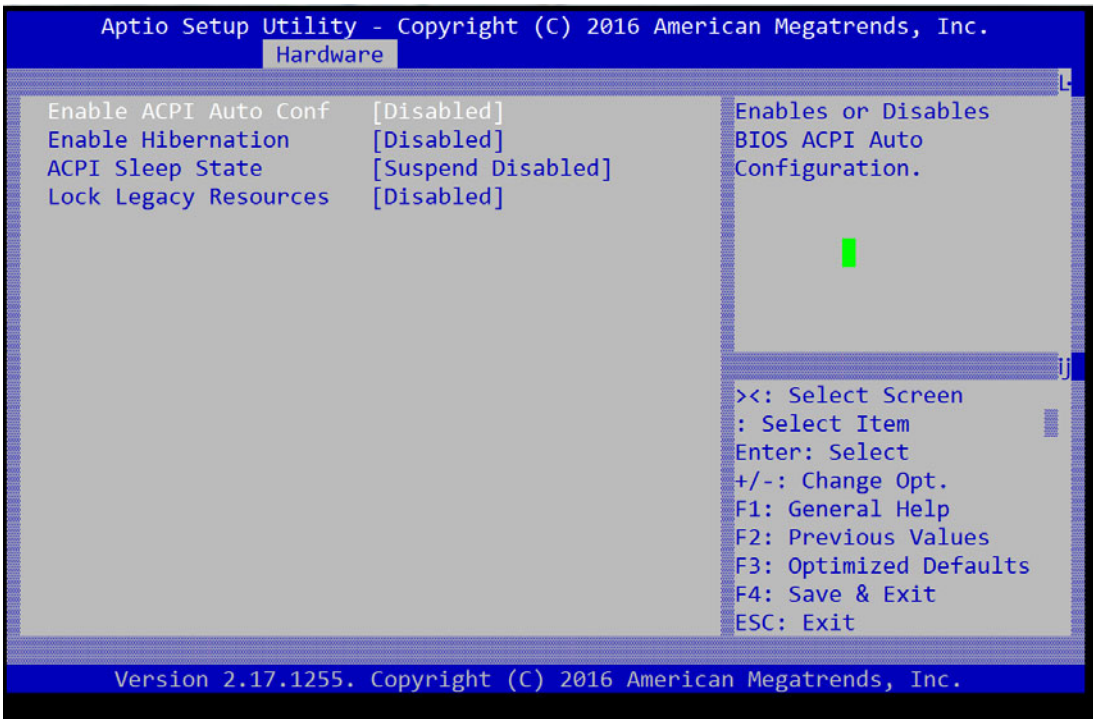


Figure 3.20 Hardware Setup_ACPI configuration

Table 3.15: Hardware Setup: ACPI configuration Menu Items

Group	Setup item	Access / Options	Description
None	Enable ACPI Auto Configuration	Enabled Disabled	Enable or disable BIOS ACPI auto configuration
	Enable Hibernation	Enabled Disabled	Enable the system ability to hibernate (OS/S4 sleep state), this option may be not effective with some O.S
	ACPI Sleep State	Suspend Disabled S1 (CPU Stop Clock)	Select the highest ACPI sleep state the system will enter when the SUS-PEND button is pressed.
	Lock Legacy Resources	Enabled Disabled	Enable lock of legacy resources

3.1.6 SETUP POST & BOOT MENU

Users can configure the system boot priority settings via the boot page. The default setting of boot priority of boot option #1 is "UEFI: Built-in EFI Shell"; Users can define the boot priorities based on the application.

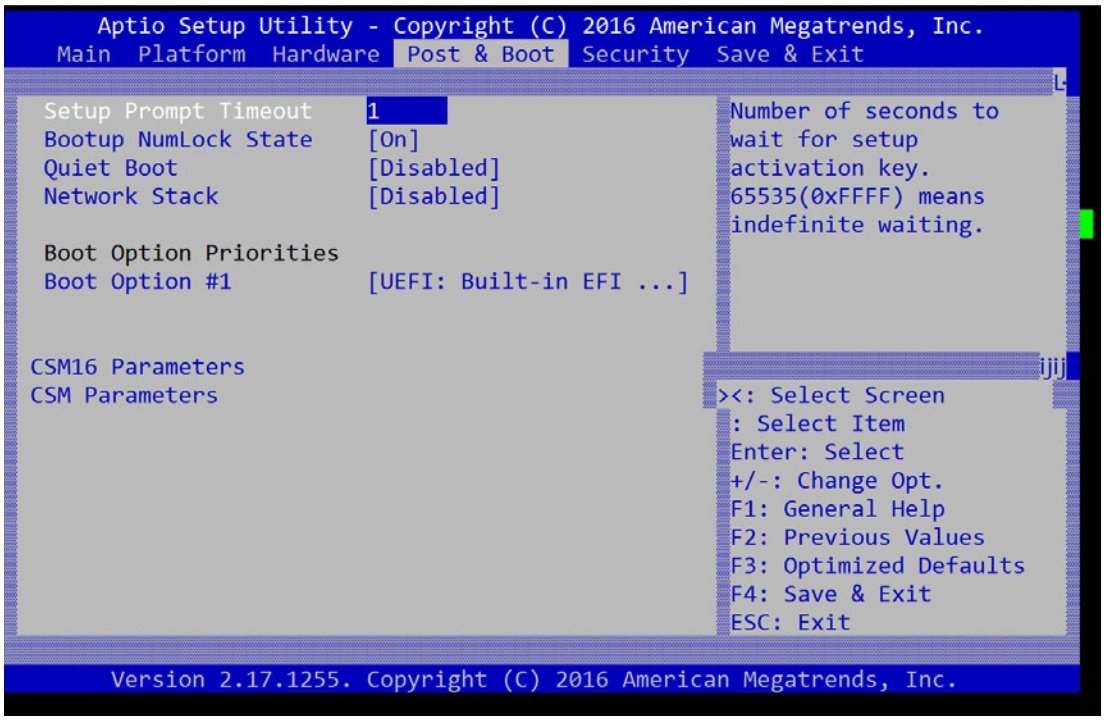


Figure 3.21 Boot Configuration

Table 3.16: Boot Configuration

Feature	Default	Description
Setup rompt Timeout	1	Number of seconds to wait for setup activation key.
Bootup NumLock State	On	Select the keyboard NumLock state.
Quiet Boot	Disabled	Enables or disables Quiet Boot option.
Network Stack	Disabled	Enables or disables boot via Network (PXE)
Boot Option Priority	User Defined	Sets the system boot order.
CSM16 Parameters	Option ROM Messages	Force BIOS Keep Current
CSM Parameters	CSM Support	Enable the CSM support

3.1.6.1 Compatibility Support Module (CSM) Configuration

This submenu allows users to configure the support for legacy BIOS mechanisms and option ROMs.

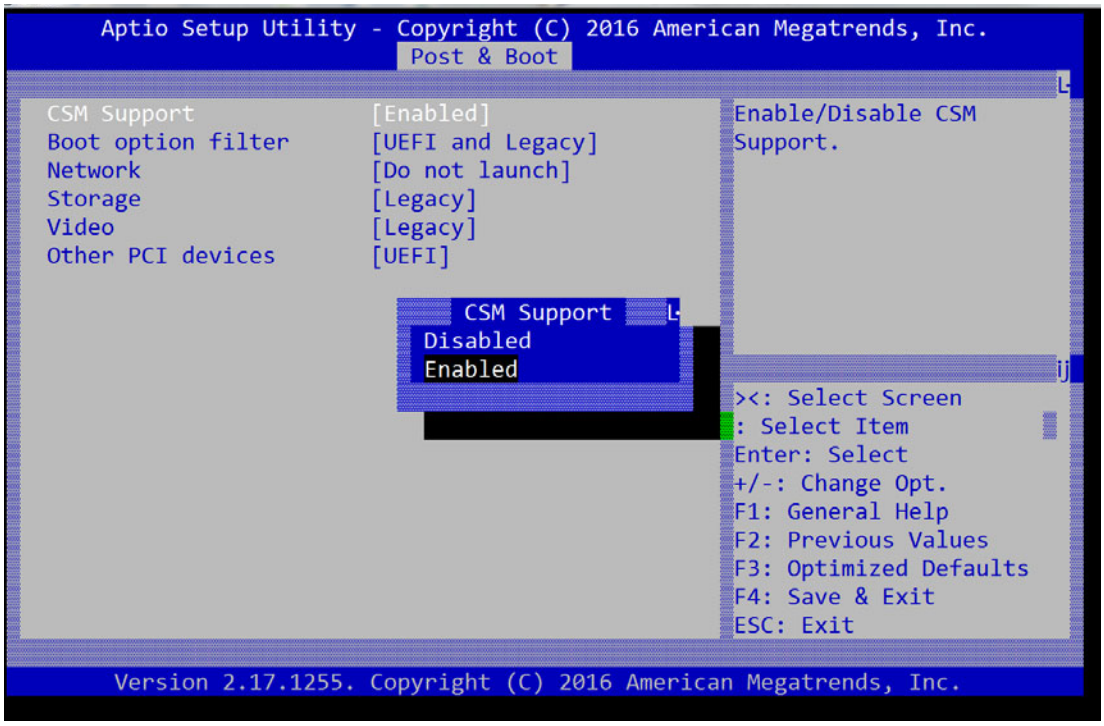


Figure 3.22 Post & Boot Setup_CSM Configuration Menu

Table 3.17: CSM Configuration Menu

Group	Setup item	Access / Options	Description
None	CSM Support	Enabled Disabled	Enables or disables the Compatibility Support Module.
	Boot option filter	UEFI and Legacy Legacy Only UEFI Only	This item allows to control the execution of legacy and UEFI compliant Option ROMs
	Network	Do not launch UEFI Legacy	This item allows a more granular control of Option-ROM execution depending of the type of extension device.
	Storage		
	Video		
	Other PCI device ROM		

3.1.6.2 CSM16 Configuration

This submenu allows users to configure the support for legacy BIOS CSM16

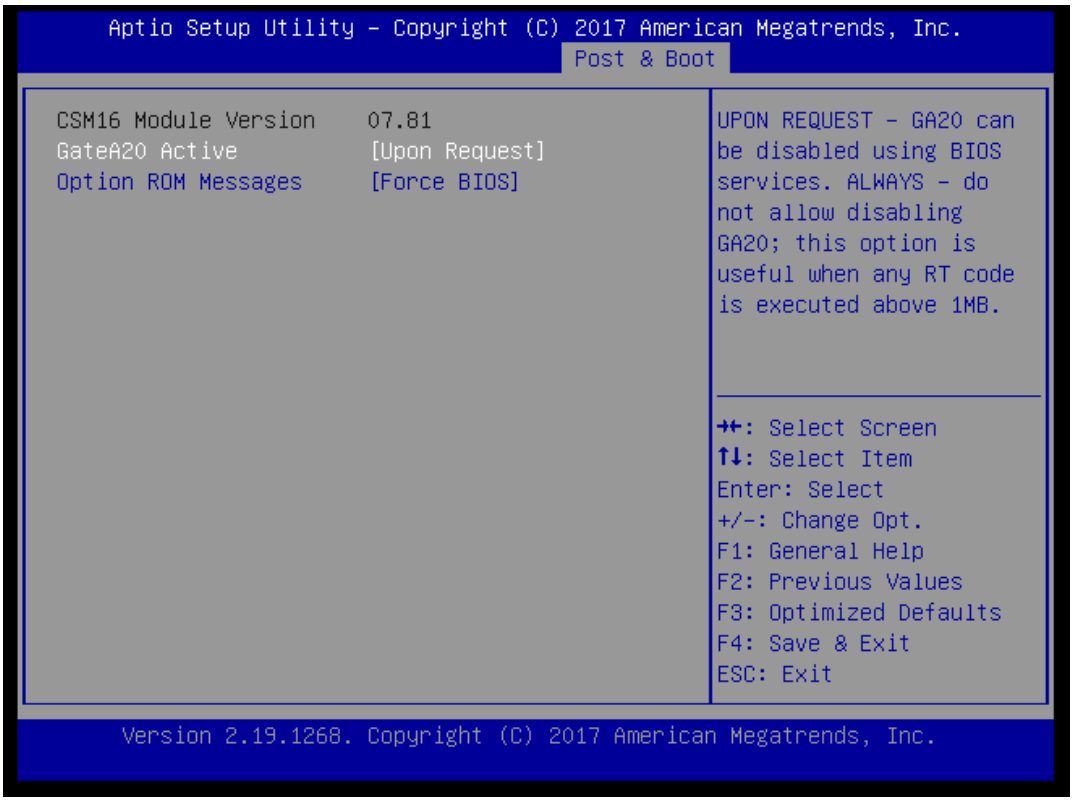


Figure 3.23 CSM16 Configuration

Table 3.18: CM16 Configuration

Group	Setup item	Access / Options	Description
None	GateA20 Active	Upon Request Always	UPON REQUEST - GA20 can be disabled using BIOS services. ALWAYS - do not allow disabling GA20; this option is useful when any RT code is executed above 1MB
	Option ROM Messages	Force BIOS Keep Current	Set display mode for Option ROM

3.1.7 SECURITY SETUP

"Administrator Password" allows users to configure the system so that a password after being installed is required each time the system boots, and/or an attempt is made to enter the Setup program.

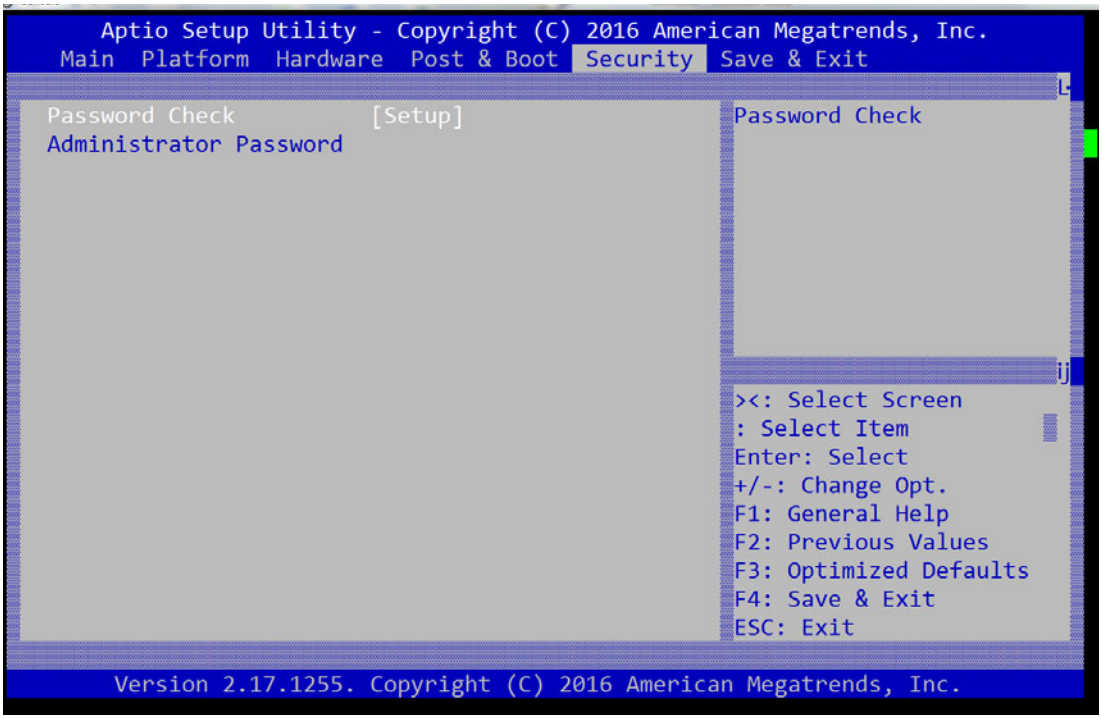


Figure 3.24 Administrator Setup

Note!

- If set the "Password Check" is [Setup], then this only limits access to Setup and is only asked for when entering Setup.
- If set the "Password Check" is [Always], 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

3.1.8 SAVE & EXIT MENU

The FWA-T011 BIOS allows users to store BIOS configuration results as "User Defaults." Users can select "Save as User Defaults" to record all changes which had been made in previous pages as the default setting for further use.

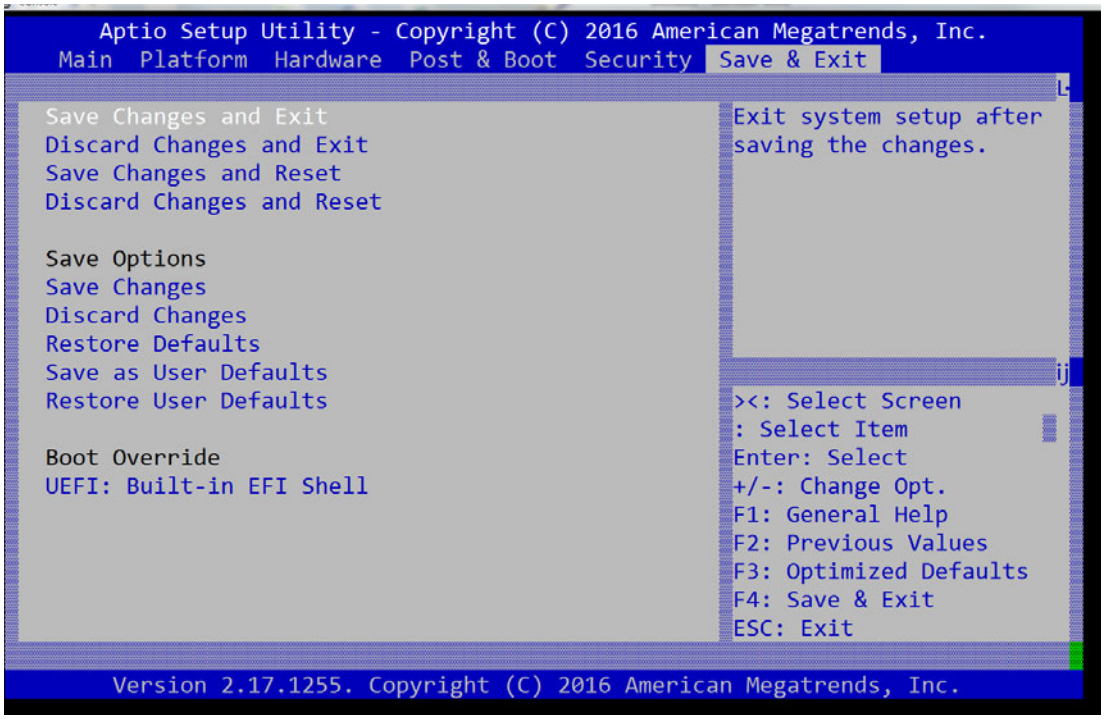


Figure 3.25 Save & Exit Menu

Table 3.19: Save & Exit Menu Options

Group	Setup item	Description
None	Save Changes and Exit	Exit setup after saving the changes. Does not update User defaults.
	Discard Changes and Exit	Exit setup without saving any changes.
	Save Changes and Reset	Reset system after saving the changes. Does not update User Defaults.
	Discard Changes and Reset	Reset system without saving the changes.
Save Options	Save Changes	Save Changes made so far to any of the setup options.
	Discard Changes	Discard Changes made so far to any of the setup options.
	Restore Defaults	Restores the BIOS factory defaults to all the setup options.
	Save as User Defaults	Saves the Current BIOS Settings as User Defaults.
	Restore User Defaults	Restores the User defaults to all the setup options.
Boot Override	UEFI: < boot device>	This option allows you to override the specified boot order and use a different boot device for the next boot.

Appendix A

GLOSSARY

ACPI	Advanced Configuration and Power Interface
AHCI	Advanced Host Controller Interface
APIC	Advanced Programmable Interrupt Controller
BIOS	Basic Input Output System
BMC	Baseboard Management Controller
CPU	Central Processing Unit
EHCI	Enhanced Host Controller Interface
FRU	Field Replaceable Unit
FW	Firmware
GbE	Gigabit Ethernet
HPM	Hardware Platform Management
HWM	Hardware Monitor (chip)
IPMC	Intelligent Platform Management Controller
IPMI	Intelligent Platform Management Interface
LOM	Lights Out Management
MAC	Media Access Control
MTBF	Mean Time Between Failures
NIC	Network Interface Controller
NMC	Network Mezzanine Card
NVRAM	Non-volatile Random Access Memory
OOS	Out Of Service
PCH	Platform Controllers Hub
PCIe	PCI Express
PECI	Platform Environment Control Interface
PCI SIG	PCI Special Interest Group
PICMG	PCI Industrial Computer Manufacturers Group
POST	Power On Self Test
PSU	Power Supply Unit
PXE	Pre-boot Execution Environment
QAT	QuickAssist Technology
QPI	QuickPath Interconnect
RASUM	Reliability, Availability, Serviceability, Usability, Maintainability
RDIMM	Registered DIMM
RMCP	Remote Management Control Protocol
RX	Receive
SAS	Serial Attached SCSI
SATA	Serial Advanced Technology Attachment
SCSI	Small Computer System Interface
SDR	Sensor Data Record
SerDes	Serializer/Deserializer
SOL	Serial Over LAN
SSD	Solid State Disk
SW	Software
TPM	Trusted Platform Module
TX	Transmit

UDIMM	Unbuffered DIMM
UHCI	Universal Host Controller Interface
USB	Universal Serial Bus

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