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# EmNANO-i2402

**COM Express® Mini Type 10  
CPU Module**

## **User's Manual**

**Version 1.0**



2017.07

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## Revision History

| Version | Release Time | Description     |
|---------|--------------|-----------------|
| 1.0     | 2017.07      | Initial release |

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## Copyright Notice

All Rights Reserved.

The information in this document is subject to change without prior notice in order to improve the reliability, design and function. It does not represent a commitment on the part of the manufacturer.

Under no circumstances will the manufacturer be liable for any direct, indirect, special, incidental, or consequential damages arising from the use or inability to use the product or documentation, even if advised of the possibility of such damages.

This document contains proprietary information protected by copyright. All rights are reserved. No part of this manual may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of the manufacturer.

## Declaration of Conformity

### CE

The CE symbol on your product indicates that it is in compliance with the directives of the Union European (EU). A Certificate of Compliance is available by contacting Technical Support.

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from ARBOR. Please contact your local supplier for ordering information.

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

### Warning

This is a class B product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

### **FCC Class B**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

#### **NOTE:**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

### **RoHS**

ARBOR Technology Corp. certifies that all components in its products are in compliance and conform to the European Union's Restriction of Use of Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive 2002/95/EC.

The above mentioned directive was published on 2/13/2003. The main purpose of the directive is to prohibit the use of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE) in electrical and electronic products. Member states of the EU are to enforce by 7/1/2006.

ARBOR Technology Corp. hereby states that the listed products do not contain unintentional additions of lead, mercury, hex chrome, PBB or PBDB that exceed a maximum concentration value of 0.1% by weight or for cadmium exceed 0.01% by weight, per homogenous material. Homogenous material is defined as a substance or mixture of substances with uniform composition (such as solders, resins, plating, etc.). Lead-free solder is used for all terminations (Sn(96-96.5%), Ag(3.0-3.5%) and Cu(0.5%)).



## **SVHC / REACH**

To minimize the environmental impact and take more responsibility to the earth we live, Arbor hereby confirms all products comply with the restriction of SVHC (Substances of Very High Concern) in (EC) 1907/2006 (REACH --Registration, Evaluation, Authorization, and Restriction of Chemicals) regulated by the European Union.

All substances listed in SVHC < 0.1 % by weight (1000 ppm)

## **Warning**

Single Board Computers and their components contain very delicate Integrated Circuits (IC). To protect the Single Board Computer and its components against damage from static electricity, you should always follow the following precautions when handling it :

1. Disconnect your Single Board Computer from the power source when you want to work on the inside.
2. Hold the board by the edges and try not to touch the IC chips, leads or circuitry.
3. Use a grounded wrist strap when handling computer components.
4. Place components on a grounded antistatic pad or on the bag that comes with the Single Board Computer, whenever components are separated from the system.

## **Replacing Lithium Battery**

Incorrect replacement of the lithium battery may lead to a risk of explosion.

The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer.

Do not throw lithium batteries into the trash-can. It must be disposed of in accordance with local regulations concerning special waste.

## **Technical Support**

If you have any technical difficulties, please do not hesitate to call or e-mail our customer service.

<http://www.arbor-technology.com>

E-mail: [info@arbor.com.tw](mailto:info@arbor.com.tw)

## **Warranty**

This product is warranted to be in good working order for a period of two years from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster.

Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Vendor will not be liable for any claim made by any other related party.

Vendors disclaim all other warranties, either expressed or implied, including but not limited to implied warranties of merchantability and fitness for a particular purpose, with respect to the hardware, the accompanying product's manual(s) and written materials, and any accompanying hardware. This limited warranty gives you specific legal rights.

Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.

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# Chapter 1

## Introduction

### **1.1. The Product**

- Soldered onboard Intel Apollo Lake SoC Processor
- Intel I210IT PCIe GbE controller
- Single Channel 24-bit LVDS and 1 x DDI port

### **1.2. About this Manual**

This manual is intended for experienced users and integrators with hardware knowledge of computers. If you are not sure about the description in this manual, consult your vendor before further handling.

We recommend that you keep one copy of this manual for the quick reference for any necessary maintenance in the future. Thank you for choosing ARBOR products.

### 1.3. Specifications

|   |   |
|---|---|
| <b>Form Factor</b>                        | COM Express® Mini Type 10 CPU Module  |
| CPU                                       | Soldered onboard Intel® Pentium N4200/Celeron N3350 processor                                 |
| Memory                                    | Soldered onboard 4GB DDR3L SDRAM, upgradable to 8GB   |
| BIOS                                      | AMI UEFI BIOS   |
| <b>I/O</b>                                |   |
| USB Port                                  | 10 x USB ports:<br>- 8 x USB 2.0 ports(Support USB2.0 only)<br>- 2 x USB 3.0 SuperSpeed ports |
| Expansion Bus                             | 4 x PCIe1 lanes, I2C Interface, SDIO  |
| Storage                                   | 2 x Serial ATA ports<br>Soldered onboard eMMC 5.0 up to 32GB (OEM Request)                    |
| Ethernet Chipset                          | 1 x Intel® i210IT PCIe GbE controller   |
| Audio                                     | HD audio link   |
| Graphic Chipset                           | Intergrated in Intel® Gen9 graphic  |
| Graphic Interface                         | LCD: Single Channel 24-bit via eDP to LVDS NXP PTN3460  |
|   | 1 x DDI port  |
| Windows 10 32-bit/64-bit<br>Linux: Ubuntu |   |
| Power Requirement                         | 5V/12V Auto detect  |
| Power Consumption                         | 1.57A@12V with N4200(Typical with PBN-9007)   |
| Operating Temp.                           | -20 ~ 85°C (-4 ~ 185°F)   |
| Operating Humidity                        | 10 ~ 95% @ 85°C (non-condensing)  |
| Dimensions (L x W)                        | 84 x 55 mm (3.3" x 2.17")   |

### 1.4. Inside the Package

Before starting to install the single board, make sure the following items are shipped:



1 x EmNANO-i2402 COM Express® Mini CPU Module

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1 x Driver CD

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1 x Quick Installation Guide

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If any of the aforelisted items is damaged or missing, contact your vendor immediately.

### 1.5. Ordering Information

|                         |  |
|-------------------------|--|
| EmNANO-i2402-N4200-4GB  | Intel® Pentium N4200 COM Express® Type 10 CPU Module w/ 4GB memory soldered on module                            |
| EmNANO-i2402-N3350-4GB  | Intel® Celeron N3350 COM Express® Type 10 CPU Module w/ 4GB memory soldered on module                            |
| EmNANO-i2402D-N4200-4GB | Intel® Pentium N4200 COM Express® Type 10 CPU Module w/ 4GB memory soldered on module, w/ 32GB eMMC(OEM Request) |
| EmNANO-i2402D-N3350-4GB | Intel® Celeron N3350 COM Express® Type 10 CPU Module w/ 4GB memory soldered on module, w/ 32GB eMMC(OEM Request) |

### 1.6. Optional Accessories

|                          |  |
|--------------------------|--|
| PBN-9007                 | PBN-9007 COM Express Mini Type 10 carrier board  |
| HS-2402-F1-T (N Series)  | Heat Spreader,AL,84*55*11mm,W/THREADED,W/PAD,ACE   |
| HS-2402-F1-NT (N Series) | Heat Spreader,AL,84*55*11mm,THROUGH HOLE,W/PAD,ACE   |
| CBK-05-9007-00           | PBN-9007 cable kit<br>1 x USB cable<br>1 x Serial port cable<br>1 x SATA cable<br>1 x SATA Power cable<br>1 x PS/2 cable |

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# Chapter 2

## Getting Started

## 2.1. The Ultra-small COM Express® Mini Module

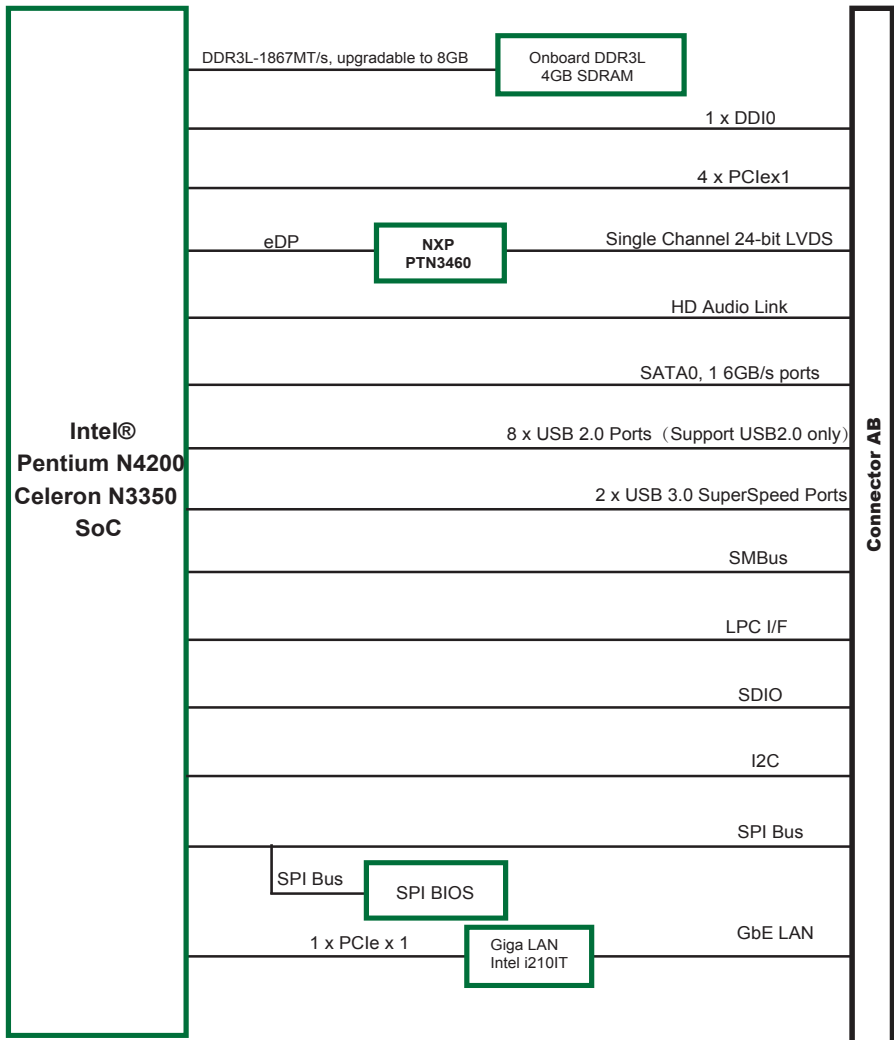
EmNANO-i2402 is a COM Express® Mini Type 10 module. 55 mm x 84 mm is the smallest in ARBOR's COM Express® product lineup, next to the Basic size (125 mm x 95 mm) and Compact size (95mm x 95mm) form factors.

The connector difference between Standard COM Express Mini type 10 and EmNANO-i2402 is tabulated as below:

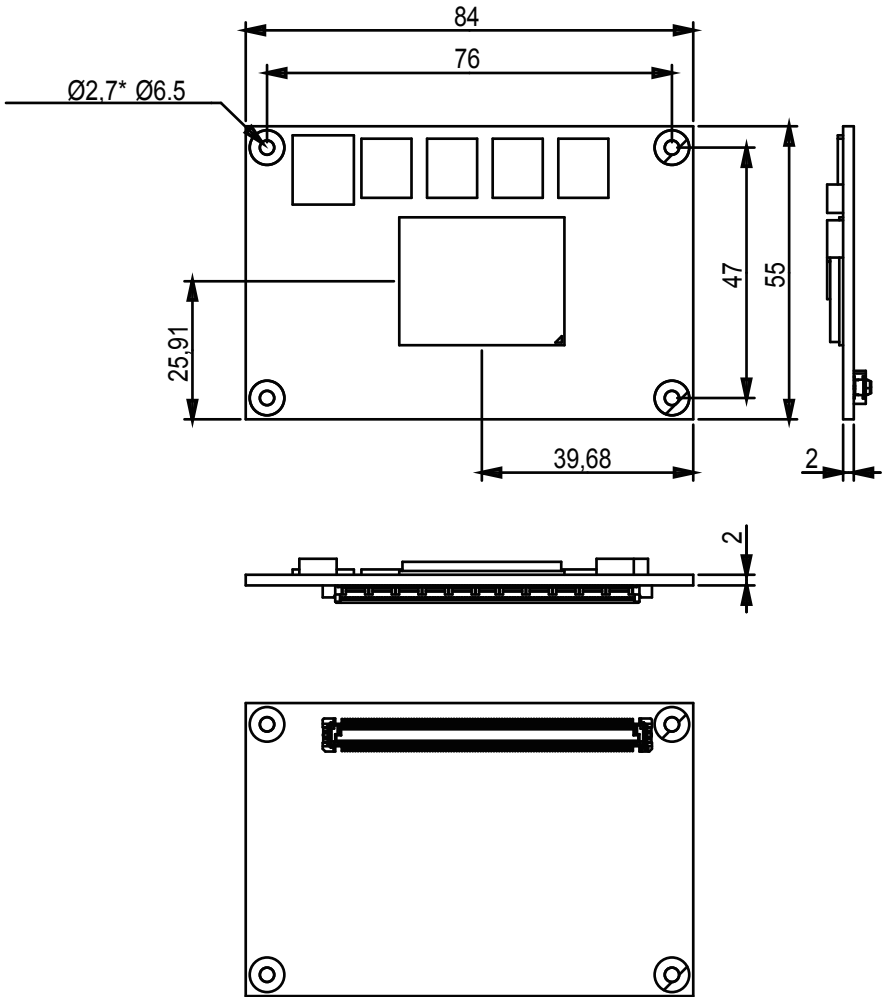
| Module Type         | Type 10 | EmNANO-i2402 |
|---------------------|---------|--------------|
| Connectors          | 1       | 1            |
| Connector Rows      | A, B    | A, B         |
| PCIe Lanes (max)    | 4       | 3            |
| LAN (Max)           | 1       | 1            |
| Serial Ports (Max)  | 2       | 1            |
| DDIO (Max)          | 1       | 1            |
| LVDS Channel A      | 1       | 1            |
| USB 2.0 Ports (Max) | 8       | 8            |
| USB 3.0 Ports (Max) | 2       | 1            |



## 2.2. Block Diagram



### 2.3 Board Dimensions



Unit : mm

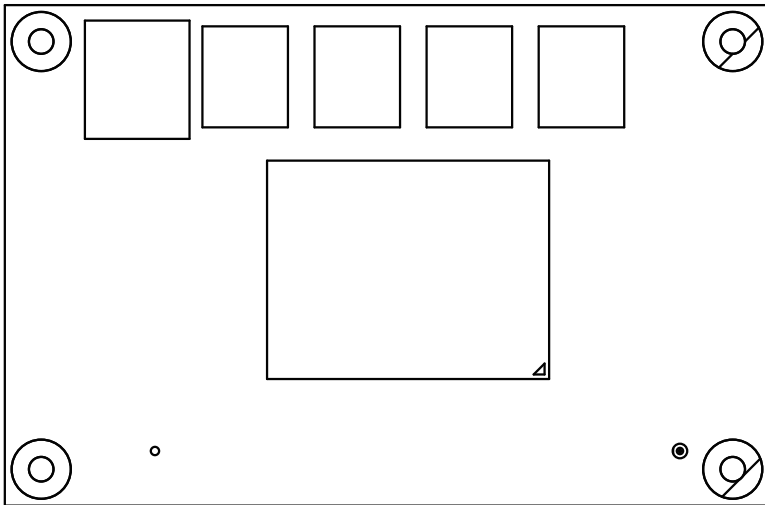
## 2.4 COM Express® Mini Type 10 AB Connector

Note: A pin with a remark "(N/C)" is a pin that the signal isn't available on this board while the remark beyond the bracket delivers the consortium-specified definition.

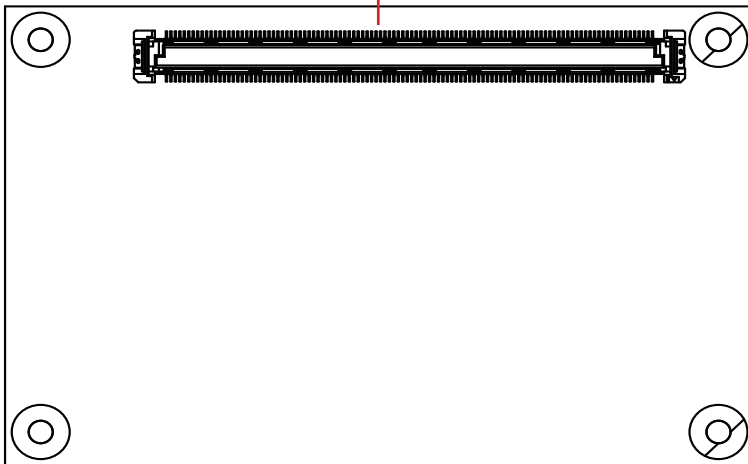
|     |                   |                   |     |
|-----|-------------------|-------------------|-----|
| B1  | GND               | GND               | A1  |
| B2  | GBE0_ACT#         | GBE0_MDI3-        | A2  |
| B3  | LPC_FRAME#        | GBE0_MDI3+        | A3  |
| B4  | LPC_AD0           | GBE0_LINK100#     | A4  |
| B5  | LPC_AD1           | GBE0_LINK1000#    | A5  |
| B6  | LPC_AD2           | GBE0_MDI2-        | A6  |
| B7  | LPC_AD3           | GBE0_MDI2+        | A7  |
| B8  | LPC_DRQ0#(N/C)    | GBE0_LINK#        | A8  |
| B9  | LPC_DRQ1#(N/C)    | GBE0_MDI1-        | A9  |
| B10 | LPC_CLK           | GBE0_MDI1+        | A10 |
| B11 | GND               | GND               | A11 |
| B12 | COME_PWR_BTN#     | GBE0_MDI0-        | A12 |
| B13 | SMB_CLK_RESUME    | GBE0_MDI0+        | A13 |
| B14 | SMB_DATA_RESUME   | GBE0_CTRÉF(N/C)   | A14 |
| B15 | SMB_ALERT#        | SLP_S3#           | A15 |
| B16 | SATA1_TX+         | SATA0_TX+         | A16 |
| B17 | SATA1_TX-         | SATA0_TX-         | A17 |
| B18 | SUS_STAT#         | SLP_S4#           | A18 |
| B19 | SATA1_RX+         | SATA0_RX+         | A19 |
| B20 | SATA1_RX-         | SATA0_RX-         | A20 |
| B21 | GND               | GND               | A21 |
| B22 | USB_SSTX0-        | USB_SSRX0-        | A22 |
| B23 | USB_SSTX0+        | USB_SSRX0+        | A23 |
| B24 | COME_PWRGD        | SLP_S4#           | A24 |
| B25 | USB_SSTX1-        | USB_SSRX1-        | A25 |
| B26 | USB_SSTX1+        | USB_SSRX1+        | A26 |
| B27 | WDT               | BATLOW#           | A27 |
| B28 | AC_SDIN2(N/C)     | ATA_ACT#          | A28 |
| B29 | AC_SDIN1(N/C)     | COME_AZ_SYNC      | A29 |
| B30 | COME_AC_SDATA_IN0 | COME_AZ_RST#      | A30 |
| B31 | GND               | GND               | A31 |
| B32 | COME_SPKR         | COME_AZ_BIT_CLK   | A32 |
| B33 | I2C_CLK0          | COME_AZ_SDATA_OUT | A33 |
| B34 | I2C_DATA0         | BIOS_DISABLE#_0   | A34 |
| B35 | THRM#             | THRMTRIP#         | A35 |
| B36 | USB7-             | USB6-             | A36 |
| B37 | USB7+             | USB6+             | A37 |
| B38 | USB_4_5_OC#(N/C)  | USB_6_7_OC#(N/C)  | A38 |
| B39 | USB5-             | USB4-             | A39 |
| B40 | USB5+             | USB4+             | A40 |
| B41 | GND               | GND               | A41 |
| B42 | USB3-             | USB2-             | A42 |
| B43 | USB3+             | USB2+             | A43 |
| B44 | USB_0_1_OC#(N/C)  | USB_2_3_OC#(N/C)  | A44 |
| B45 | USB1-             | USB0-             | A45 |
| B46 | USB1+             | USB0+             | A46 |
| B47 | PLTRST#_BUFF      | VCC_RTC           | A47 |
| B48 | EXCD1_CPPE#       | PLTRST#_BUFF      | A48 |
| B49 | COME_RSTBTN#      | EXCD0_CPPE#       | A49 |
| B50 | PLTRST#_BUFF      | LPC_SERIRQ        | A50 |
| B51 | GND               | GND               | A51 |
| B52 | RSVD(N/C)         | RSVD(N/C)         | A52 |
| B53 | RSVD(N/C)         | RSVD(N/C)         | A53 |
| B54 | SD_CMD            | SD_DATA0          | A54 |
| B55 | RSVD(N/C)         | RSVD(N/C)         | A55 |

|      |                       |                    |      |
|------|-----------------------|--------------------|------|
| B56  | RSVD (N/C)            | RSVD (N/C)         | A56  |
| B57  | SD_WP                 | GND                | A57  |
| B58  | PCIE_RXP3             | COME_PCIE_TXP3+    | A58  |
| B59  | PCIE_RXN3             | COME_PCIE_TXN3-    | A59  |
| B60  | GND                   | GND                | A60  |
| B61  | PCIE_RXP2             | COME_PCIE_TXP2     | A61  |
| B62  | PCIE_RXN2             | COME_PCIE_TXN2     | A62  |
| B63  | SD_CD#                | SD_DATA1           | A63  |
| B64  | PCIE_RXP1             | COME_PCIE_TXP1     | A64  |
| B65  | PCIE_RXN1             | COME_PCIE_TXN1     | A65  |
| B66  | PCIE_WAKE#            | GND                | A66  |
| B67  | WAKE1#                | SD_DATA2           | A67  |
| B68  | PCIE_RXP0             | COME_PCIE_TXP0     | A68  |
| B69  | PCIE_RXN0             | COME_PCIE_TXN0     | A69  |
| B70  | GND                   | GND                | A70  |
| B71  | COME_DDI0_TXP0        | LVDS_A0+           | A71  |
| B72  | COME_DDI0_TXN0        | LVDS_A0-           | A72  |
| B73  | COME_DDI0_TXP1        | LVDS_A1+           | A73  |
| B74  | COME_DDI0_TXN1        | LVDS_A1-           | A74  |
| B75  | COME_DDI0_TXP2        | LVDS_A2+           | A75  |
| B76  | COME_DDI0_TXN2        | LVDS_A2-           | A76  |
| B77  | DDIO_PAIR4+ (N/C)     | COME_LCD_VDDEN     | A77  |
| B78  | DDIO_PAIR4- (N/C)     | LVDS_A3+           | A78  |
| B79  | COME_LCD_BKLT_EN_R    | LVDS_A3-           | A79  |
| B80  | GND                   | GND                | A80  |
| B81  | COME_DDI0_TXP3        | LVDS_A_CLK+        | A81  |
| B82  | COME_DDI0_TXN3        | LVDS_A_CLK-        | A82  |
| B83  | COME_LCD_BKLT_CTRL    | LVDS_I2C_CLK       | A83  |
| B84  | VCC_5V_SBY            | LVDS_I2C_DAT       | A84  |
| B85  | VCC_5V_SBY            | SD_DATA3           | A85  |
| B86  | VCC_5V_SBY            | RSVD (N/C)         | A86  |
| B87  | VCC_5V_SBY            | RSVD / eDP_HP0(NC) | A87  |
| B88  | BIOS_DISABLE#_1       | COME_PCIE_CLKP1    | A88  |
| B89  | COME_DDI_HP0          | COME_PCIE_CLKN1    | A89  |
| B90  | GND                   | GND                | A90  |
| B91  | DDIO_PAIR5+ (N/C)     | SPI_POWER          | A91  |
| B92  | DDIO_PAIR5- (N/C)     | COME_SPI_MISO      | A92  |
| B93  | DDIO_PAIR6+ (N/C)     | SD_CLK             | A93  |
| B94  | DDIO_PAIR6- (N/C)     | COME_SPI_CK1       | A94  |
| B95  | COME_DDI_DDC_AUX_SEL  | COME_SPI_MOSI      | A95  |
| B96  | USB_HOST_PRSENT (N/C) | TPM_PP (N/C)       | A96  |
| B97  | COME_SPI_CS#0         | TYPE10#            | A97  |
| B98  | COME_DDCCLK_AUX       | COME_UART1_TXD     | A98  |
| B99  | COME_DDCDATA_AUX#     | COME_UART1_RXD     | A99  |
| B100 | GND                   | GND                | A100 |
| B101 | FAN_PWMOUT            | COME_UART2_TXD     | A101 |
| B102 | FAN_TACHIN(N/C)       | COME_UART2_RXD     | A102 |
| B103 | COME_SLEEP#           | COME_LID#          | A103 |
| B104 | VCC_12V               | VCC_12V            | A104 |
| B105 | VCC_12V               | VCC_12V            | A105 |
| B106 | VCC_12V               | VCC_12V            | A106 |
| B107 | VCC_12V               | VCC_12V            | A107 |
| B108 | VCC_12V               | VCC_12V            | A108 |
| B109 | VCC_12V               | VCC_12V            | A109 |
| B110 | GND                   | GND                | A110 |

## 2.5 Connectors Quick Reference



**COM Express Connector**



## 2.6. Driver Installation Notes

The board supports Windows 10. Find the necessary drivers on the CD that comes with your purchase. For different OS, the driver/utility installation may vary slightly, but generally they are similar. **DO** follow the sequence below to install all drivers to prevent errors:

**Audio**→**Chipset**→**Ethernet**→**Graphics**→**Serial IO**→**TXE**

Find the drivers on CD by the following paths:

### Windows 10 32-bit/64-bit

#### Windows 10

| Device    | Driver Path  |
|-----------|--|
| Audio     | \\Apollolake-i240x\Audio\7687_PG436_Win10_Win8.1_Win8_Win7_WHQLx64   |
| Chipset   | \\Apollolake-i240x\Chipset   |
| Ethernet  | \\Apollolake-i240x\LAN   |
| Graphic   | \\Apollolake-i240x\Graphic   |
| Serial IO | \\Apollolake-i240x\Serial IO\SerialIO_30.100.1620.02_APL_PV_Win10x64 |
| TXE       | \\Apollolake-i240x\TXE   |

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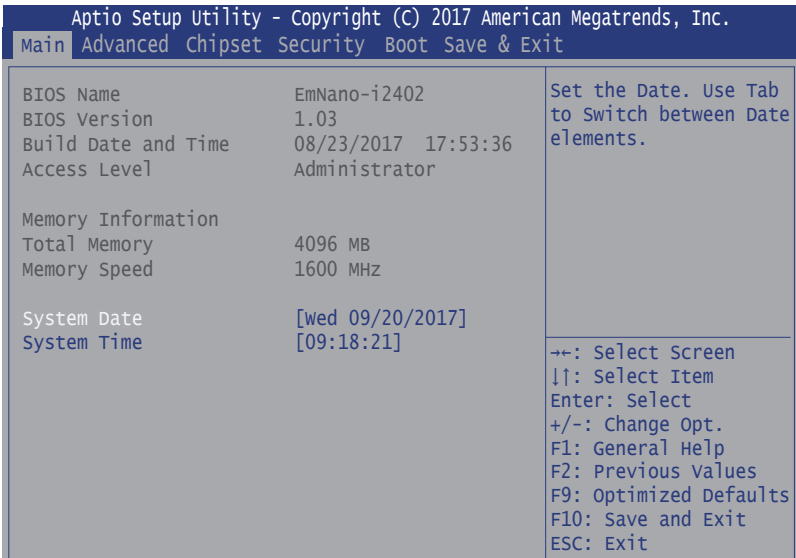
# Chapter 3

## BIOS

## BIOS

The BIOS Setup utility is featured by American Megatrends Inc to configure the system settings stored in the system's BIOS ROM. The BIOS is activated once the computer powers on. When the computer is off, the battery on the main board supplies power to BIOS RAM.

To enter the BIOS Setup utility, keep hitting the "Delete" key upon powering on the computer.



| Menu        | Description   |
|-------------|---|
| Main        | See <a href="#">5.1. Main</a> on page <a href="#">16</a>            |
| Advanced    | See <a href="#">5.2. Advanced</a> on page <a href="#">17</a>        |
| Chipset     | See <a href="#">5.3. Chipset</a> on page <a href="#">25</a>         |
| Security    | See <a href="#">5.4 Security</a> on page <a href="#">26</a>         |
| Boot        | See <a href="#">5.5. Boot</a> on page <a href="#">27</a>            |
| Save & Exit | See <a href="#">5.6. Save &amp; Exit</a> on page <a href="#">28</a> |



## Key Commands

The BIOS Setup utility relies on a keyboard to receive user's instructions. Hit the following keys to navigate within the utility and use the utility.

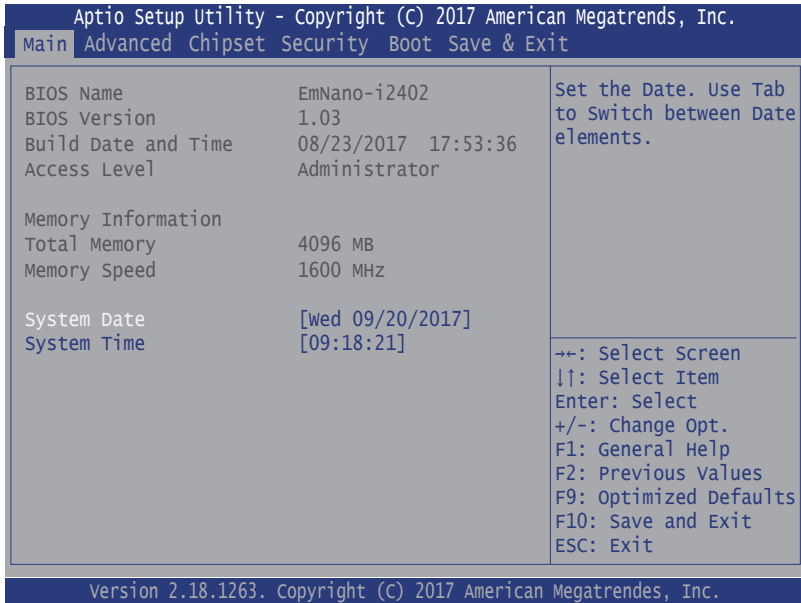
| Keystroke            | Function   |
|----------------------|--|
| ← →                  | Moves left/right between the top menus.  |
| ↓ ↑                  | Moves up/down between highlight items.   |
| <b>Enter</b>         | Selects an highlighted item/field.   |
| <b>Esc</b>           | <ul style="list-style-type: none"> <li>▶ On the top menus:<br/>Use <b>Esc</b> to quit the utility without saving changes to CMOS. (The screen will prompt a message asking you to select <b>OK</b> or <b>Cancel</b> to exit discarding changes.</li> <li>▶ On the submenus:<br/>Use <b>Esc</b> to quit current screen and return to the top menu.</li> </ul> |
| <b>Page Up / +</b>   | Increases current value to the next higher value or switches between available options.  |
| <b>Page Down / -</b> | Decreases current value to the next lower value or switches between available options.   |
| <b>F1</b>            | Opens the <b>Help</b> of the BIOS Setup utility.   |
| <b>F10</b>           | Exits the utility saving the changes that have been made. (The screen then prompts a message asking you to select <b>OK</b> or <b>Cancel</b> to exit saving changes.)  |

Note: Pay attention to the "WARNING" that shows at the left pane onscreen when making any change to the BIOS settings.

This BIOS Setup utility is updated from time to time to improve system performance and hence the screenshots hereinafter may not fully comply with what you actually have onscreen.

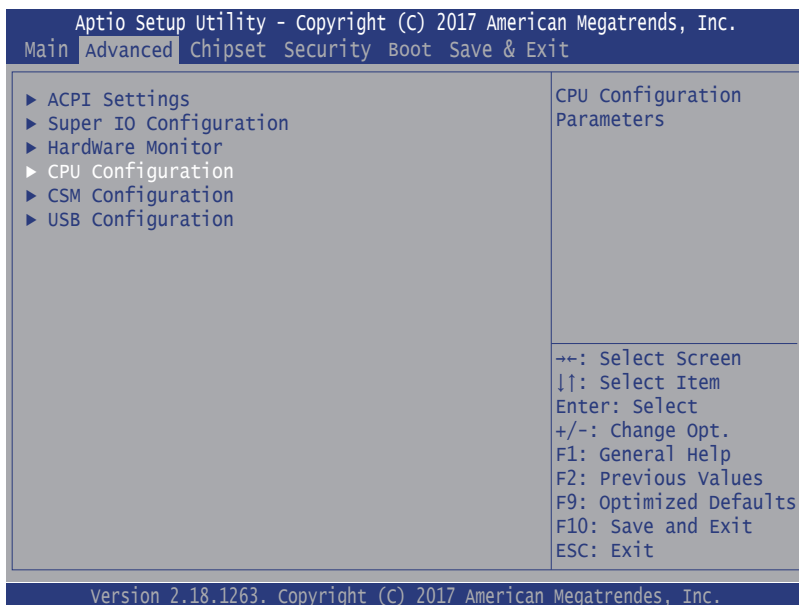
## 5.1. Main

The **Main** menu features the settings of **System Date** and **System Time** and displays some BIOS info.



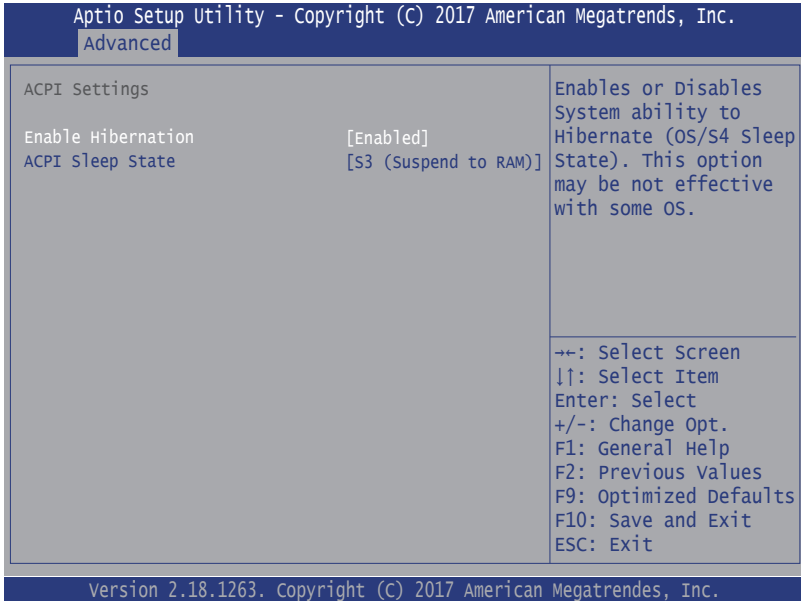
| Setting                    | Description  |
|----------------------------|--|
| <b>BIOS Name</b>           | Delivers the model name of the computer.                                 |
| <b>BIOS Version</b>        | Delivers the computer's BIOS version.                                    |
| <b>Build Date and Time</b> | Delivers the date and time when the BIOS Setup utility was made/updated. |
| <b>Access Level</b>        | Delivers the level that the BIOS is being accessed at the moment.        |
| <b>Memory Information</b>  | Delivers the total memory and memory speed.                              |
| <b>System Date</b>         | Sets system date.  |
| <b>System Time</b>         | Sets system time.  |

## 5.2. Advanced



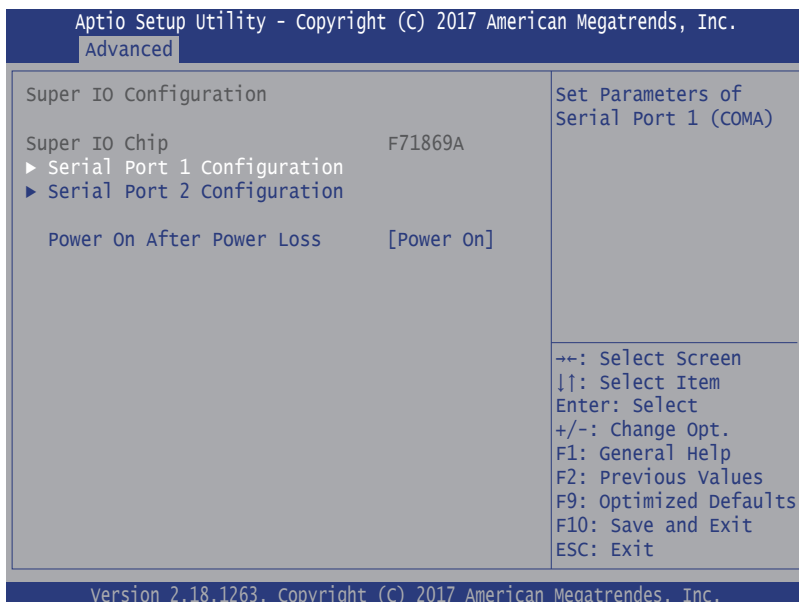
| Setting                       | Description  |
|-------------------------------|--|
| <b>ACPI Settings</b>          | See <a href="#">5.2.1. ACPI Settings</a> on page <a href="#">18</a>          |
| <b>Super IO Configuration</b> | See <a href="#">5.2.2. Super IO Configuration</a> on page <a href="#">19</a> |
| <b>Hardware Monitor</b>       | See <a href="#">5.2.3. Hardware Monitor</a> on page <a href="#">20</a>       |
| <b>CPU Configuration</b>      | See <a href="#">5.2.4. CPU Configuration</a> on page <a href="#">21</a>      |
| <b>CSM Configuration</b>      | See <a href="#">5.2.5. CSM Configuration</a> on page <a href="#">22</a>      |
| <b>USB Configuration</b>      | See <a href="#">5.2.6. USB Configuration</a> on page <a href="#">23</a>      |

### 5.2.1. ACPI Settings



| Setting                   | Description   |
|---------------------------|---|
| <b>Enable Hibernation</b> | <b>Enable</b> (default) or <b>Disable</b> system ability to hibernate (OS/S4 Sleep State). This option may be not effective with some OS.                 |
| <b>ACPI Sleep State</b>   | Select ACPI sleep state the system will enter when the SUSPEND button is pressed.<br>► <b>Options: Suspend Disabled and S3 (Suspend to RAM)</b> (default) |

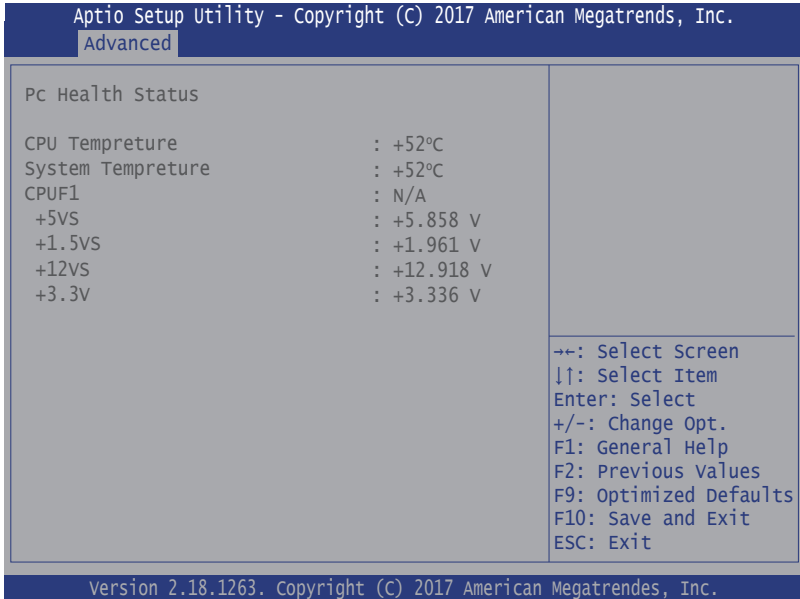
## 5.2.2. Super IO Configuration



| Setting               | Description  |
|-----------------------|--|
| Serial Port           | <b>Enable</b> (default) or <b>Disable</b> Serial Port (COM).   |
| Change Settings       | Select an optimal setting for Super IO device. <ul style="list-style-type: none"> <li>▶ Options for Serial Port 1:               <ul style="list-style-type: none"> <li><b>Auto;</b></li> <li><b>IO=3F8h; IRQ=4</b> (default) ;</li> <li><b>IO=3F8h; IRQ=3, 4, 7, 10, 11;</b></li> <li><b>IO=2F8h; IRQ=3, 4, 7, 10, 11;</b></li> <li><b>IO=3E8h; IRQ=3, 4, 7, 10, 11;</b></li> <li><b>IO=2E8h; IRQ=3, 4, 7, 10, 11;</b></li> </ul> </li> <li>▶ Options for Serial Port 2:               <ul style="list-style-type: none"> <li><b>Auto</b></li> <li><b>IO=2F8h; IRQ=3</b> (default)</li> <li><b>IO=3F8h; IRQ=3, 4, 7, 10, 11;</b></li> <li><b>IO=2F8h; IRQ=3, 4, 7, 10, 11;</b></li> <li><b>IO=3E8h; IRQ=3, 4, 7, 10, 11;</b></li> <li><b>IO=2E8h; IRQ=3, 4, 7, 10, 11;</b></li> </ul> </li> </ul> |
| RS485 AutoFlow        | Only available for Serial Port 2.<br><b>Enable</b> or <b>Disable</b> (default) RS485 autoflow.   |
| Restore AC Power Loss | Specify what state to go to when power is re-applied after a power failure. <ul style="list-style-type: none"> <li>▶ Options: <b>Power On</b> (default) and <b>Power Off</b></li> </ul>  |

### 5.2.3. Hardware Monitor

Select this submenu to view the main board's hardware status. Select it to run a report of various info as depicted below:

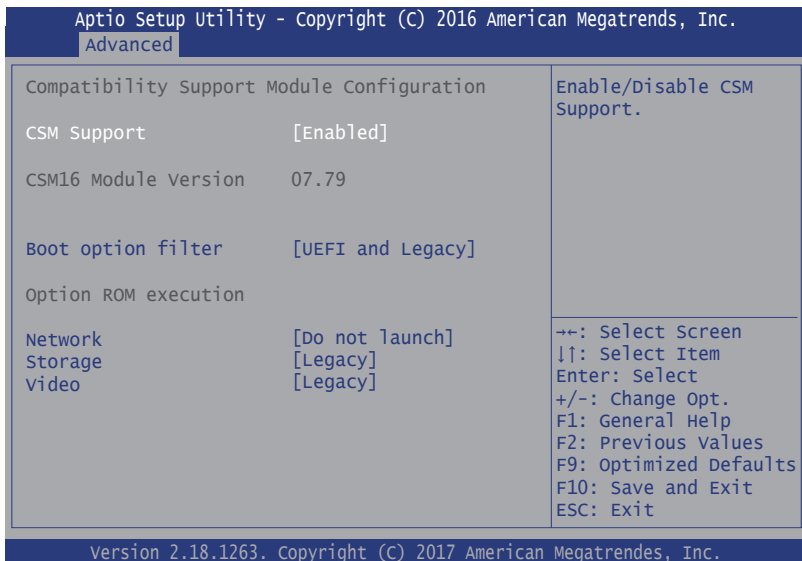


### 5.2.4. CPU Configuration



| Setting                         | Description   |
|---------------------------------|---|
| <b>Socket 0 CPU Information</b> | Delivers socket specific CPU information.   |
| <b>EIST</b>                     | <b>Enable</b> (default) / <b>Disable</b> Intel SpeedStep.   |
| <b>Turbo Mode</b>               | <b>Enable</b> / <b>Disable</b> (default) Turbo Mode.<br>Only available when EIST (Intel Speed Step) is enabled. |
| <b>C-States</b>                 | <b>Enable</b> (default) / <b>Disable</b> CPU C States   |

### 5.2.5. CSM Configuration



| Setting                   | Description  |
|---------------------------|--|
| <b>CSM Support</b>        | <b>Enable</b> (default) or <b>Disable</b> CSM Support.   |
| <b>Boot option filter</b> | Control the Legacy/UEFI ROMs priority.<br>▶ Options: <b>UEFI and Legacy</b> (default), <b>Legacy only</b> , <b>UEFI only</b> |
| <b>Network</b>            | Control the execution of UEFI and Legacy PXE OpROM<br>▶ Options: <b>Do not launch</b> (default) and <b>Legacy</b>            |
| <b>Storage</b>            | Control the execution of UEFI and Legacy Storage OpROM<br>▶ Options: <b>UEFI and Legacy</b> (default)                        |
| <b>Video</b>              | Control the execution of UEFI and Legacy Video OpROM<br>▶ Options: <b>UEFI and Legacy</b> (default)                          |



## 5.2.6. USB Configuration

| Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc. |  |
|--|--|
| Advanced   |  |
| USB Configuration  | Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.         |
| USB Module Version   | 16   |
| USB Devices:   |  |
| 1 XHCI   |  |
| USB Devices:   |  |
| 1 Keyboard, 1 Mouse, 1 Point                                       |  |
| Legacy USB Support   | [Enabled]  |
| XHCI Hand-off  | [Enabled]  |
| USB Mass Storage Driver Support                                    | [Enabled]  |
| USB hardware delays and time-outs:                                 |  |
| USB Transfer time-out  | [20 sec]   |
| Device reset time-out  | [20 sec]   |
| Device power-up delay  | [Auto]   |
|  | + -: Select Screen<br>↓↑: Select Item<br>Enter: Select<br>+/-: Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F9: Optimized Defaults<br>F10: Save and Exit<br>ESC: Exit |
| Version 2.18.1263. Copyright (C) 2017 American Megatrends, Inc.    |  |

| Setting                                | Description  |
|--|--|
| <b>Legacy USB Support</b>              | Enables/disables legacy USB support. <ul style="list-style-type: none"> <li>▶ Options available are <b>Enabled</b> (default), <b>Disabled</b> and <b>Auto</b>.</li> <li>▶ Select <b>Auto</b> to disable legacy support if no USB device are connected.</li> <li>▶ Select <b>Disabled</b> to keep USB devices available only for EFI applications.</li> </ul> |
| <b>XHCI Hand-off</b>                   | This is a workaround for Oses without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver. <ul style="list-style-type: none"> <li>▶ The optional settings are: <b>Enabled</b> (default) / <b>Disabled</b>.</li> </ul>  |
| <b>USB Mass Storage Driver Support</b> | Enables/disables USB Mass Storage Driver Support. <ul style="list-style-type: none"> <li>▶ The optional settings are: <b>Enabled</b> (default) / <b>Disabled</b>.</li> </ul>   |
| <b>USB hardware delay and time-out</b> |  |
| <b>USB Transfer time-out</b>           | Use this item to set the time-out value for control, bulk, and interrupt transfers. <ul style="list-style-type: none"> <li>▶ Options: <b>1 sec, 5 sec, 10 sec, 20 sec</b> (default)</li> </ul>   |
| <b>Device reset time-out</b>           | Use this item to set USB mass storage device start unit command time-out. <ul style="list-style-type: none"> <li>▶ Options available are: <b>10 sec, 20 sec</b> (default), <b>30 sec, 40 sec</b></li> </ul>  |

### Device power-up delay

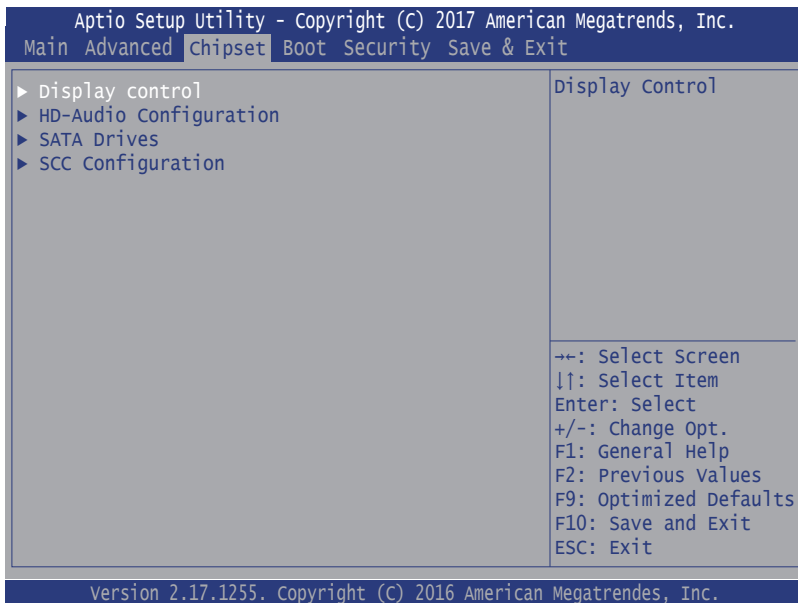
Use this item to set maximum time the device will take before it properly reports itself to the host controller. 'Auto' uses default value: for a root port it is 100 ms, for a hub port the delay is taken from hub descriptor.

► Options available are:

**Auto:** Default

**Manual:** Select **Manual** you can set value for the following sub-item: 'Device Power-up delay in seconds', the delay range in from 1 to 40 seconds, in one second increments.

### 5.3. Chipset



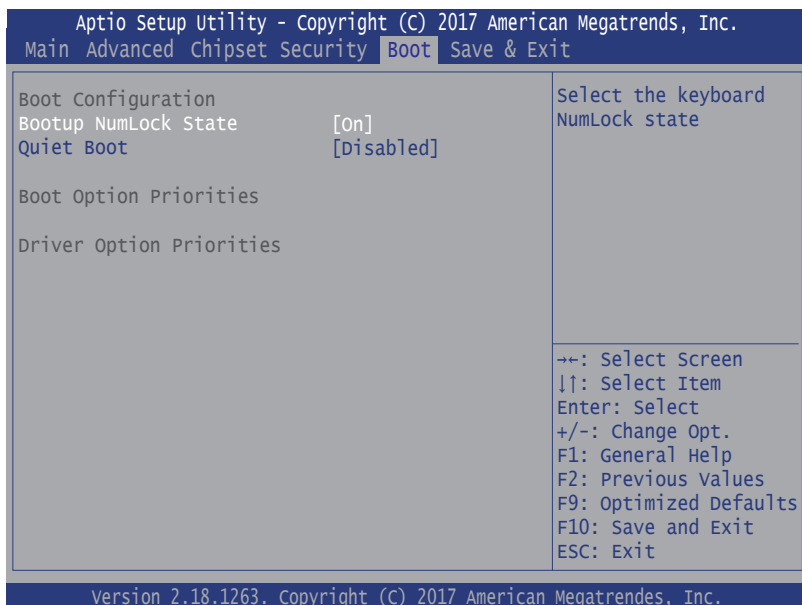
| Setting                       | Description   |
|-------------------------------|---|
| <b>Display Control</b>        |   |
| <b>Boot Display</b>           | Select the Video Device which will be activated during POST.<br>▶ Options: <b>Auto (default)</b> , <b>EFP</b> and <b>LFP</b>                                |
| <b>Active LFP</b>             | Select the Active LFP Configuration.<br>▶ Options:<br><b>No LVDS (default)</b> and <b>eDP Port-A</b>  |
| <b>HD Audio Configuration</b> | <b>Enable</b> (default) / <b>Disable</b> HD-Audio support.  |
| <b>SATA Drives</b>            |   |
| <b>Chipset SATA</b>           | <b>Enable (default)</b> / <b>Disable</b> the Chipset SATA Controller  |
| <b>Port 0/1</b>               | <b>Enable (default)</b> / <b>Disable</b> SATA port  |
| <b>SATA Device Type</b>       | Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.<br>▶ Options:<br><b>Hard Disk Drive (default)</b> and <b>Solid State Drive</b> |
| <b>SCC Configuration</b>      |   |
| <b>SCC SD Card Support</b>    | <b>Enable (default)</b> / <b>Disable</b> SCC SD Card Support  |

## 5.4 Security



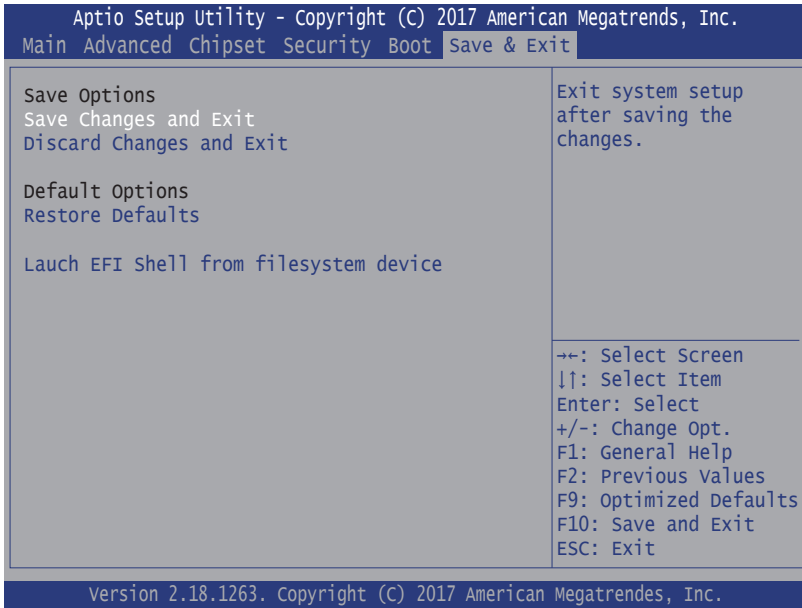
| Setting                      | Description   |
|------------------------------|---|
| Setup Administrator Password | <p>To set up an administrator password:</p> <ol style="list-style-type: none"> <li>1. Select <b>Administrator Password</b>.</li> <li>2. An <b>Create New Password</b> dialog then pops up onscreen.</li> <li>3. Enter your desired password that is no less than 3 characters and no more than 20 characters.</li> <li>4. Hit [Enter] key to submit.</li> </ol> |

## 5.5. Boot



| Setting                     | Description   |
|-----------------------------|---|
| <b>Bootup NumLock State</b> | Sets whether to enable or disable the keyboard's NumLock state when the system starts up.<br>► Options available are <b>On</b> (default) and <b>Off</b> .               |
| <b>Quiet Boot</b>           | Sets whether to <b>enable</b> or <b>disable</b> (default) display the POST (Power-on Self Tests) messages or the system manufacturer's full screen logo during booting. |

## 5.6. Save & Exit



| Setting  | Description   |
|--|---|
| <b>Save Changes and Reset</b>                  | Saves the changes and quits the BIOS Setup utility.   |
| <b>Discard Changes and Exit</b>                | Quits the BIOS Setup utility without saving the change(s).  |
| <b>Restore Defaults</b>                        | Restore/Load Default values for all the setup options.<br><ul style="list-style-type: none"> <li>▶ Enter the item and then a dialog box pops up:<br/><b>Load Optimized Defaults? (Yes/ No)</b></li> <li>▶ Select <b>Yes</b> or <b>No</b> as required.</li> </ul>                                  |
| <b>Launch EFI Shell from filesystem device</b> | Attempts to launch EFI ShellRestore/Load Default values for all the setup options.<br><ul style="list-style-type: none"> <li>▶ Enter the item and then a dialog box pops up:<br/><b>Save configuration and reset? (Yes/ No)</b></li> <li>▶ Select <b>Yes</b> or <b>No</b> as required.</li> </ul> |