



EC700-ADN/ EC710-ADN

Fanless Embedded System

User's Manual

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FCC and DOC Statement on Class A

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

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

Notice:

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

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About this Manual

This manual can be retrieved from the website.

The manual is subject to change and update without notice, and may be based on editions that do not resemble your actual products. Please visit our website or contact our sales representatives for the latest editions.

Warranty

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

About this Package

The package contains the following items. If any of these items are missing or damaged, please contact your dealer or sales representative for assistance.

• 1 System Unit

Note: The items are subject to change in the developing stage.

The product and accessories in the package may not come similar to the information listed above. This may differ in accordance with the sales region or models in which it was sold. For more information about the standard package in your region, please contact your dealer or sales representative.

Static Electricity Precautions

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

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

Important:

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

Safety Precautions

- Use the correct DC / AC input voltage range.
- Unplug the power cord before removing the system chassis cover for installation or servicing. After installation or servicing, cover the system chassis before plugging in the power cord.
- · There is danger of explosion if battery incorrectly replaced.
- Replace only with the same or equivalent specifications of batteries recommend by the manufacturer.
- Dispose of used batteries according to local ordinance.
- Keep this system away from humid environments.
- Make sure the system is placed or mounted correctly and stably to prevent the chance of dropping or falling may cause damage.
- The openings on the system shall not be blocked and shall be kept in distance from

other objects to make sure of proper air ventilation to protect the system from overheating.

- Dress the cables, especially the power cord, so they will not be stepped on, in contact with high temperature surfaces, or cause any tripping hazards.
- Do not place anything on top of the power cord. Use a power cord that has been approved for use with the system and is compliant with the voltage and current ranges required by the system's electrical specifications.
- If the system is to be unused or stored for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
- · If one of the following occurs, consult a service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated the system.
 - The system has been exposed to moisture.
 - The system is not working properly.
 - The system is physically damaged.
- The unit uses a three-wire ground cable which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace the outlet.
- Disconnect the system from the electricity outlet before cleaning. Use a damp cloth for cleaning the surface. Do not use liquid or spray detergents for cleaning.
- Before connecting, make sure that the power supply voltage is correct. The device is connected to a power outlet which should be grounded connection.

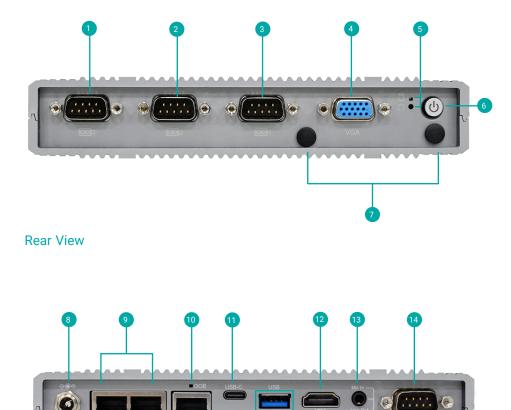


The system may burn fingers while running. Wait for 30 minutes to handle electronic parts after power off.

Chapter 1 - Introduction

Overview - EC700-ADN

Front View



NAVA V

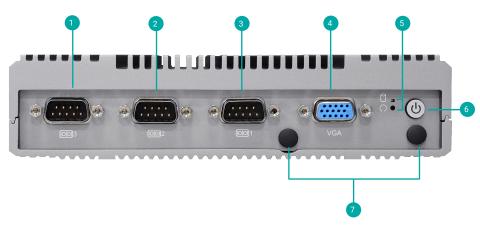
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VVV

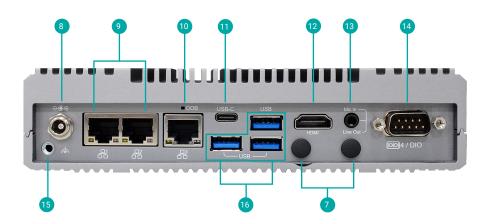


# Overview - EC710-ADN

# **Front View**



**Rear View** 



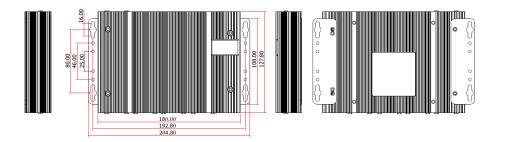




# **Dimensions**

### EC700-ADN

# 



# **Key Features**

#### On Board OOB built-in:

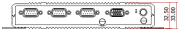
Hardware status remote control&monitor, BIOS remote setup/update, OS remote recovery, Open-SSH/ UEFI Shell/In-Band Windows support.

Slim and Fanless: Slim and fanless design for limited-space condition.

Intel TCC within the system: Supported by X series CPU and TSN standard up to 2.5GbE (Opt.)

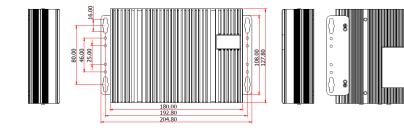
On Board DDR5 & eMMC Support: LPDDR5 4800 MHz memory down eMMC module –Easy maintenance.

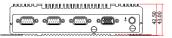
Up to Quad Display Support: Support via HDMI/USB-C/VGA, Quad display support by Dev.



### EC710-ADN

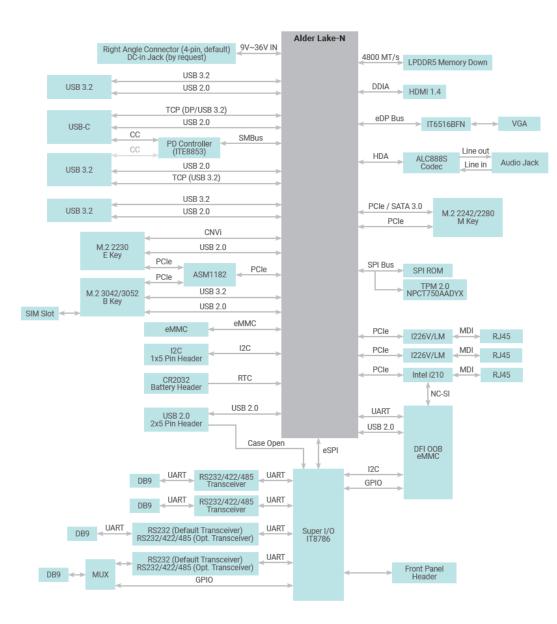






# Chapter 1

# Block Diagram



# Chapter 1 INTRODUCTION

# ► Specifications

| N                   | lodel Name | EC700-ADN                                                                                                                                                                                                                                                                                                                                                                                                                                        | EC710-ADN                                                                                                                                                                                                                 |
|---------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Processor<br>SYSTEM |            | Intel Alder Lake-N Series<br>Intel PC Client Series<br>Intel® Processor N50 2 Cores, 1.0GHz to 3.4 GHz<br>Intel® Processor N97 4 Cores, 2.0GHz to 2.9 GHz<br>Intel® Processor N200 4 Cores, 1.0GHz to 3.2 GHz<br>Intel® Embedded Series (Support TCC)<br>Intel® Atom® X7211E 2 Cores,1.0GHz to 2.9 GHz<br>Intel® Atom® X7213E 2 Cores,1.7GHz to 2.9 GHz<br>Intel® Atom® X7425E 4 Cores,1.5GHz to 2.7 GHz<br>*TCC default disable in BIOS setting | Intel Alder Lake-N Series Intel PC Client Series<br>Intel <sup>®</sup> Core <sup>™</sup> i3-N305 8 Cores, 1.0GHz to 3.0 GHz<br>(TDP 15W by conditional support)                                                           |
|                     | Memory     | 8GB/16GB LPDDR5 4800 Memory down                                                                                                                                                                                                                                                                                                                                                                                                                 | 8GB/16GB LPDDR5 4800 Memory down                                                                                                                                                                                          |
|                     | BIOS       | AMI SPI 256Mbit (supports UEFI boot only)                                                                                                                                                                                                                                                                                                                                                                                                        | AMI SPI 256Mbit (supports UEFI boot only)                                                                                                                                                                                 |
| GRAPHICS            | Controller | Intel® UHD Graphics                                                                                                                                                                                                                                                                                                                                                                                                                              | Intel® UHD Graphics                                                                                                                                                                                                       |
|                     | Feature    | Execution Units: Up to 32 EUs<br>3D API:<br>Open GL 4.6, DirectX12, Vulkan 1.2 (Windows) Mesa 3D, OpenGL 4.6, Vulkan<br>1.2 (Linux)<br>Precision: FP32, FP16, INT8<br>Compute: OpenCL 3.0                                                                                                                                                                                                                                                        | <b>Execution Units</b> : Up to 32 EUs<br><b>3D API</b> :<br>Open GL 4.6, DirectX12, Vulkan 1.2 (Windows) Mesa 3D, OpenGL 4.6,<br>Vulkan 1.2 (Linux)<br><b>Precision</b> : FP32, FP16, INT8<br><b>Compute</b> : OpenCL 3.0 |
|                     | Display    | 1 x VGA<br>1 x HDMI 1.4<br>1 x USB-C (DP1.2 Alt. Mode)                                                                                                                                                                                                                                                                                                                                                                                           | 1 x VGA<br>1 x HDMI 1.4<br>1 x USB-C (DP1.2 Alt. Mode)                                                                                                                                                                    |
|                     | Internal   | 1 x M.2 2280 M key (PCIe Gen3/SATA)<br>*A heatsink & a thermal pad are required.                                                                                                                                                                                                                                                                                                                                                                 | 1 x M.2 2280 M key (PCIe Gen3/SATA)<br>*A heatsink & a thermal pad are required.                                                                                                                                          |
| STORAGE             | eMMC       | eMMC module insert available<br>750-EC7004-700G: 64GB EMMC (default)                                                                                                                                                                                                                                                                                                                                                                             | eMMC module insert available                                                                                                                                                                                              |
| EXPANSION           | Interface  | 1 x M.2 2230 E key<br>(USB 2.0/PCle, support CNVi)<br>1 x M.2 3042/3052 B key: USB3.0/USB2.0/<br>PCle with SIM<br>1 x M.2 2242/2280 M key (*PCle/SATA)                                                                                                                                                                                                                                                                                           | 1 x M.2 2230 E key<br>(USB 2.0/PCle, support CNVi)<br>1 x M.2 3042/3052 B key: USB3.0/USB2.0/<br>PCle with SIM<br>1 x M.2 2242/2280 M key (*PCle/SATA)                                                                    |

\*PCIe:PCIex2 support by project

# Chapter 1 INTRODUCTION

| Мо             | del Name          | EC700-ADN                                                                                                                                     | EC710-ADN                                                                                                                                     |
|----------------|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| ETHERNET       | Controller        | 2 x Intel Ethernet controller i226 2.5GbE<br>(TSN support by project)<br>1 x Intel Ethernet controller i210 GbE<br>(support DFI OOB function) | 2 x Intel Ethernet controller i226 2.5GbE<br>(TSN support by project)<br>1 x Intel Ethernet controller i210 GbE<br>(support DFI OOB function) |
| AUDIO          | Audio Codec       | REALTEK ALC888S                                                                                                                               | REALTEK ALC888S                                                                                                                               |
| LED            | Indicators        | 1 x Power LED<br>1 x Storage LED                                                                                                              | 1 x Power LED<br>1 x Storage LED                                                                                                              |
|                | Serial            | COM 1/2: RS232/422/485<br>COM 3: RS232                                                                                                        | COM 1/2: RS232/422/485<br>COM 3: RS232                                                                                                        |
|                | Antenna Hole      | 2 x antenna holes                                                                                                                             | 2 x antenna holes                                                                                                                             |
| FRONT I/O      | Display           | 1 x VGA                                                                                                                                       | 1 x VGA                                                                                                                                       |
|                | Button            | 1 x Power Button<br>1 x Reset Button                                                                                                          | 1 x Power Button<br>1 x Reset Button                                                                                                          |
|                | Ethernet          | 2 x 2.5GbE RJ45<br>1 x GbE RJ45 (support DFI OOB)                                                                                             | 2 x 2.5GbE RJ45<br>1 x GbE RJ45 (support DFI OOB)                                                                                             |
|                | Serial            | COM 4: RS232/DIO                                                                                                                              | COM 4: RS232/DIO                                                                                                                              |
| REAR I/O       | USB               | 3 x USB 3.2 type A<br>1 x USB-C 3.2                                                                                                           | 3 x USB 3.2 type A<br>1 x USB-C 3.2                                                                                                           |
|                | Display           | 1 x HDMI                                                                                                                                      | 1 x HDMI                                                                                                                                      |
|                | Audio             | 1 x 3.5mm Line out/Mic In                                                                                                                     | 1 x 3.5mm Line out/Mic In                                                                                                                     |
|                | Antenna Hole      | 2 x antenna holes                                                                                                                             | 2 x antenna holes                                                                                                                             |
|                | Storage           | 1 x MicroSD (Opt.)                                                                                                                            | 1 x MicroSD (Opt.)                                                                                                                            |
| WATCHDOG TIMER | Output & Interval | System reset, programmable via software from 1 to 255 seconds                                                                                 | System reset, programmable via software from 1 to 255 seconds                                                                                 |
| SECURITY       | TPM               | TPM 2.0 Support                                                                                                                               | TPM 2.0 Support                                                                                                                               |

| Мо                              | del Name                        | EC700-ADN                                                                        | EC710-ADN                                                                        |
|---------------------------------|---------------------------------|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
|                                 | Туре                            | Wide range 9~36VDC                                                               | Wide range 9~36VDC                                                               |
| POWER                           | RTC Battery                     | RTC battery CR2032                                                               | RTC battery CR2032                                                               |
|                                 | Connector                       | 2.5mm DC Jack                                                                    | 2.5mm DC Jack                                                                    |
| DS SUPPORT                      | Microsoft                       | Windows <sup>®</sup> 10 IoT Enterprise<br>Windows <sup>®</sup> 11 IoT Enterprise | Windows <sup>®</sup> 10 IoT Enterprise<br>Windows <sup>®</sup> 11 IoT Enterprise |
|                                 | Linux                           | Ubuntu 22.04                                                                     | Ubuntu 22.04                                                                     |
|                                 | Operating Temperature           | -5 to 60°C with 0.2m/s air flow                                                  | -5 to 60°C with 0.2m/s air flow                                                  |
| NVIRONMENT                      | Storage Temperature             | -40 to 85°C                                                                      | -40 to 85°C                                                                      |
| R                               | Relative Humidity               | 10 to 90% RH (non-condensing)                                                    | 10 to 90% RH (non-condensing)                                                    |
| MECHANICAL                      | Construction                    | Aluminum + Metal                                                                 | Aluminum + Metal                                                                 |
|                                 | Mounting                        | Wall mount/VESA Mount/DIN-Rail                                                   | Wall mount/VESA Mount/DIN-Rail                                                   |
|                                 | Dimensions (W x H x D)          | 180 x 33 x 127.8 mm                                                              | 180 x 43 x 127.8 mm                                                              |
|                                 | Weight                          | TBD                                                                              | TBD                                                                              |
|                                 | Shock<br>(During Operation)     | 30G, IEC-60068-2-27 MIL-STD-810G                                                 | 30G, IEC-60068-2-27 MIL-STD-810G                                                 |
| STANDARDS AND<br>CERTIFICATIONS | Vibration<br>(During Operation) | 3 Grms, IEC 60068-2-64 MIL-STD-810G                                              | 3 Grms, IEC 60068-2-64 MIL-STD-810G                                              |
|                                 | Certifications                  | CE, FCC, RoHS, UKCA                                                              | CE, FCC, RoHS, UKCA                                                              |

# **Chapter 2 - Hardware Installations**

# **Removing the Chassis Cover**

Please observe the following guidelines and follow the instructions to open the system.

1. Make sure the system and all other peripheral devices connected to it have been powered off.

2. Disconnect all power cords and cables.

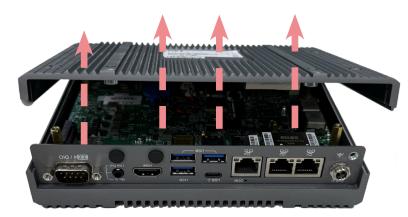
#### Step 1:

The 4 screws of the system are used to secure the cover to the chassis. Remove the screws and put them in a safe place for later use.



### Step 2:

Lift up the cover to open the system.



### Step 3:

The boards can be easily accessed after the chassis cover is removed.



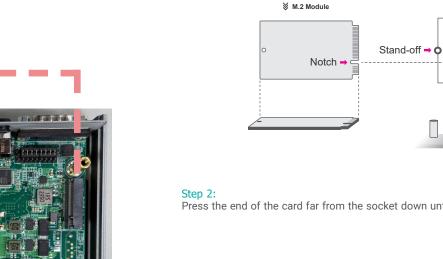
Key

# ► Installing an M.2 Card

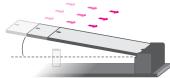
Please follow the steps below to install the card into the socket.

#### Step 1:

Insert the card into the socket at an angle while making sure the notch and key are perfectly aligned.



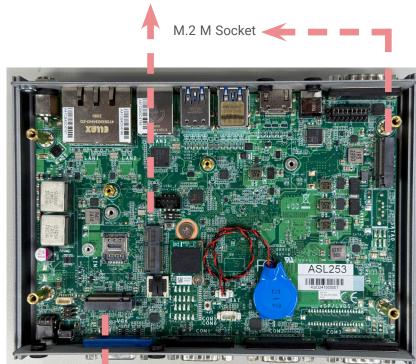
Press the end of the card far from the socket down until against the stand-off.



#### Step 3:

Screw tight the card onto the stand-off with a screw driver and a stand-off screw until the gap between the card and the stand-off closes up. The card should be lying parallel to the board when it's correctly mounted.





M.2 E Socket



# Installing an Antenna

Before installing the antenna, please make sure that the following safety cautions are wellattended.

- 1. Make sure the PC and all other peripheral devices connected to it has been powered down.
- 2. Disconnect all power cords and cables.

#### Step 1:

There are antenna holes reserved on the front and back side of the system and covered by rubber plugs. Please remove the plug prior to installing an antenna.

### EC710-ADN



### EC700-ADN

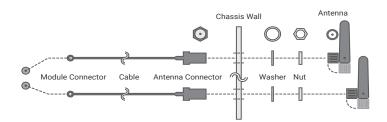






#### Step 2:

Connect the internal cable to the board's antenna connector, screw the antenna connector through the antenna hole with washers and nuts, and screw on the antenna as illustrated below.



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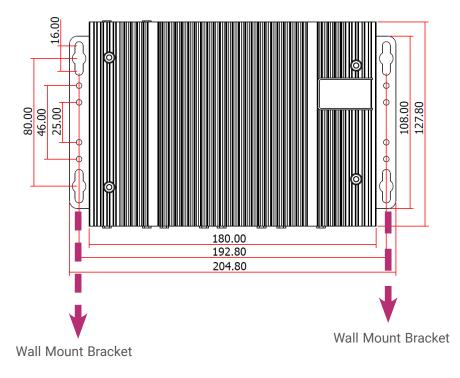
# Chapter 2 HARDWARE INSTALLATION

# Mounting Options

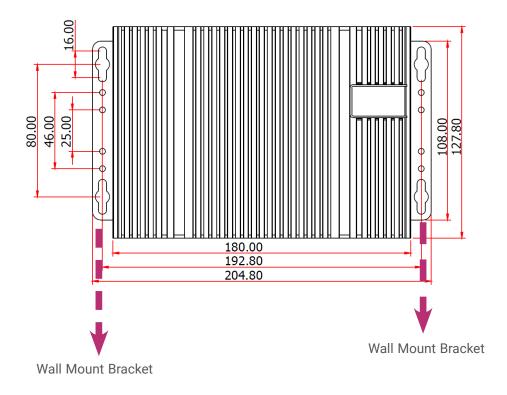
# Wall Mount

The wall mount kit containing two mounting brackets can be attached to the bottom of the system for mounting onto desired locations, such as walls, stands, or shelves. Locate the mounting holes on the bottom of the system as shown in the photo. Screw on the two brackets onto the system tightly as illustrated below.

# EC700-ADN







# **VESA Mount**

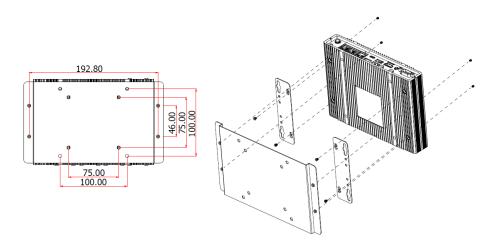
The VESA mount bracket has two sets of pre-drilled mounting holes -75mm x 75mm, 100mm x 100mm - to adapt to mounting variants. Mount the bracket onto the tapped holes on the back of a monitor, a stand or a wall rack.

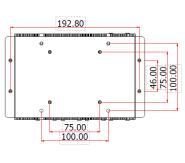
Attache the brackets to the bottom side of the system as illustrated below.

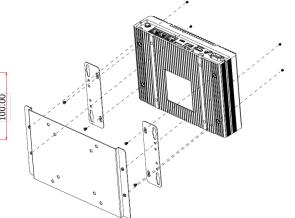
Mount the assembly onto the VESA mount bracket previously attached to the back of a monitor.

### EC700-ADN

# EC710-ADN







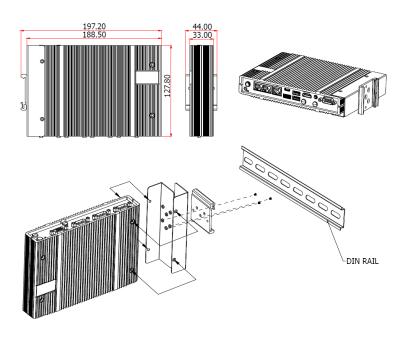
### **DIN Rail Mount**

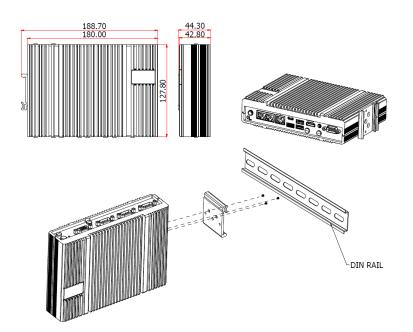
### EC710-ADN

The DIN Rail Mount kits comes with two brackets (one shorter in depth than the other), and one DIN Rail clip. Please follow the steps to mount the system onto a DIN Rail.

- 1. Screw the shorter bracket onto the side of the system
- 2. Screw the longer bracket onto the side of the system opposite to the side where the shorter bracket is mounted. The longer bracket shall be on top and overlap with the shorter one on the side.
- 3. Screw the clip onto the side of the assembly.
- 4. When correctly mounted, the assembly shall resemble the illustration below.
- 5. Clip the assembly onto a DIN Rail.

### EC700-ADN







Note:

It does not matter which side of the system the brackets are mounted onto and what orientation of the system is. The brackets and mounting screw holes are highly symetrycal. Please configure the mounting according to field needs.

# Chapter 3 SYSTEM SETTINGS

# **Chapter 3 - System Settings**

# System Layout



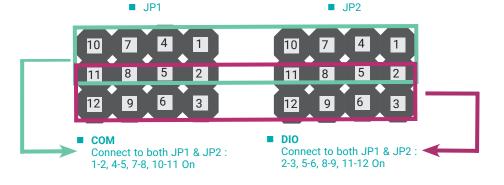
# Jumper Settings

COM4/DIO Selection (JP1 & JP2)





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



# Chapter 3 SYSTEM SETTINGS

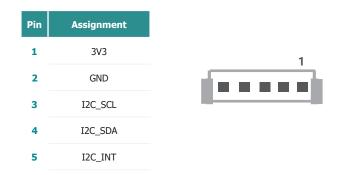
Pin Assignment

# I2C Header (J8)









| Pin | Assignment | Pin | Assignment |
|-----|------------|-----|------------|
| 1   | PWR_BTN    | 2   | 3V3        |
| 3   | GND        | 4   | SUS_LED#   |
| 5   | SYS_RST    | 6   | HD_LED#    |



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# Chapter 3 SYSTEM SETTINGS

# USB2.0 / Case Open Header (J5)



### DB9-COM4 Pins Customization (JP1 & JP2)

Connect to JP1 (pin 2, ,5, 8, 11) &JP2 (pin 2, ,5, 8, 11) if there is internal signal communication request via DB9-COM4 connector without I/O shield changed.



JP2 ■ JP1 Pin Assignment Pin Assignment JP2 DB9 JP1 2 1 NC 5V 2 10 6 2 --> 2 3 NC 4 USB2\_N 5 7 5 5 --> 5 NC 6 USB2\_P 8 8 --> 9 7 GND GND 8 1 **11** --> 9 11 9 NC CASEOPEN-10 00000  $(\bigcirc$  $( \bigcirc )$ 600009

DB9

1

2

3

4

->

-->

-->

# **Chapter 4 - BIOS Settings**

## Overview

The BIOS is a program that takes care of the basic level of communication between the CPU and peripherals. It contains codes for various advanced features found in this system board.

The BIOS allows you to configure the system and save the configuration in a battery-backed CMOS so that the data retains even when the power is off. In general, the information stored in the CMOS RAM of the EEPROM will stay unchanged unless a configuration change has been made such as a hard drive replaced or a device added.

It is possible that the CMOS battery will fail causing CMOS data loss. If this happens, you need to install a new CMOS battery and reconfigure the BIOS settings.

Note:
 The BIOS is constantly updated to improve the performance of the system board; therefore the BIOS screens in this chapter may not appear the same as the actual one. These screens are for reference purpose only.

#### **Default Configuration**

Most of the configuration settings are either predefined according to the Load Optimal Defaults settings which are stored in the BIOS or are automatically detected and configured without requiring any actions. There are a few settings that you may need to change depending on your system configuration.

#### Entering the BIOS Setup Utility

The BIOS Setup Utility can only be operated from the keyboard and all commands are keyboard commands. The commands are available at the right side of each setup screen.

The BIOS Setup Utility does not require an operating system to run. After you power up the system, the BIOS message appears on the screen and the memory count begins. After the memory test, the message "Press DEL to run setup" will appear on the screen. If the message disappears before you respond, restart the system or press the "Reset" button. You may also restart the system by pressing the <Ctrl> <Alt> and <Del> keys simultaneously.

#### Legends

| Keys               | Function                                                               |
|--------------------|------------------------------------------------------------------------|
| Right / Left arrow | Move the highlight left or right to select a menu                      |
| Up / Down arrow    | Move the highlight up or down between submenus or fields               |
| <enter></enter>    | Enter the highlighted submenu                                          |
| + (plus key)/F6    | Scroll forward through the values or options of the highlighted field  |
| - (minus key)/F5   | Scroll backward through the values or options of the highlighted field |
| <f1></f1>          | Display general help                                                   |
| <f2></f2>          | Display previous values                                                |
| <f9></f9>          | Optimized defaults                                                     |
| <f10></f10>        | Save and Exit                                                          |
| <esc></esc>        | Return to previous menu                                                |

#### Scroll Bar

When a scroll bar appears to the right of the setup screen, it indicates that there are more available fields not shown on the screen. Use the up and down arrow keys to scroll through all the available fields.

#### Submenu

When " $\blacktriangleright$ " appears on the left of a particular field, it indicates that a submenu which contains additional options are available for that field. To display the submenu, move the highlight to that field and press <Enter>.

# Main

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.

| Project Name                 | EC700-ADN / EC710-ADN | ▲ Set the Date. Use Tab to               |
|------------------------------|-----------------------|------------------------------------------|
| BIOS Version                 | B24C.06A              | switch between Date elements.            |
| Board/System ID              | 000/000               | Default Ranges:                          |
| UUID                         |                       | Year: 1998-9999                          |
| 0000000-0000-0000-0000-00000 | 000000                | Months: 1–12<br>Days: Dependent on month |
| FSP version                  | 00.02.89.40           | Range of Years may vary.                 |
| RC version                   | OC.E0.89.40           |                                          |
| Тире                         | Intel(R) Atom(TM)     |                                          |
| . 51                         | ×7835RE               |                                          |
| ID                           | 0×B06E0               |                                          |
| Stepping                     | AO                    |                                          |
| Microcode Revision           | 17                    | ↔+: Select Screen                        |
|                              |                       | t↓: Select Item                          |
| Memory RC Version            | 0.0.4.74              | Enter: Select                            |
| Total Memory                 | 16384 MB              | +/- : Change Opt.                        |
| Memory Frequency             | 4800 MHz              | F1: General Help                         |
|                              |                       | F2: Previous Values                      |
| PCH SKU                      | N ASL IOT INDU SKU    | F9: Optimized Defaults                   |
| ME FW Version                | 16.50.12.1453         | F10: Save & Reset                        |
| ME Firmware SKU              | Consumer SKU          | ESC: Exit                                |
| PMC FW Version               | 160.50.0.1010         |                                          |
| System Date                  | [Tue 12/17/2024]      |                                          |

#### System Date

The date format is <month>, <date>, <year>. Press "Tab" to switch to the next field and press "-" or "+" to modify the value.

#### System Time

The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

# Advanced

The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

#### Important:

Setting incorrect field values may cause the system to malfunction.

| Main Advanced Chipset Security                                                                                                                                                                                                                                                                                                                                                          | Aptio Setup – AMI<br>Boot Save & Exit |                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul> <li>RC ACPI Settings</li> <li>CPU Configuration</li> <li>Power &amp; Performance</li> <li>PCH-FW Configuration</li> <li>Intel(R) Time Coordinated Computing</li> <li>Trusted Computing</li> <li>IT8786 Super IO Configuration</li> <li>IT8786 Hardware Monitor</li> <li>Setial Port Console Redirection</li> <li>Network Stack Configuration</li> <li>USB Power Control</li> </ul> |                                       | <pre>System ACPI Parameters.  ++: Select Screen 1+: Select Item Enter: Select +/- : Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save &amp; Reset ESC: Exit</pre> |
| Version 2                                                                                                                                                                                                                                                                                                                                                                               | 22.1293 Copyright (C) 2024            | AMI                                                                                                                                                                                               |

### **RC ACPI Configuration**

| Advanced                                                                         | Aptio Setup – AMI                  |                                                                                                     |
|----------------------------------------------------------------------------------|------------------------------------|-----------------------------------------------------------------------------------------------------|
| RC ACPI Settings<br>Native ASPM<br>Wake System from S5 via RTC<br>State After G3 | (Auto)<br>(Disabled)<br>(S0 State) | Enabled – OS Controlled ASPM,<br>Disabled – BIOS Controlled ASPM                                    |
|                                                                                  |                                    |                                                                                                     |
|                                                                                  |                                    | ++: Select Screen<br>14: Select Item<br>Enter: Select<br>+/- : Change Opt.                          |
|                                                                                  |                                    | F1: General Help<br>F2: Previous Values<br>F9: Optimized Defaults<br>F10: Save & Reset<br>ESC: Exit |
| Versin                                                                           | on 2.22.1293 Copyright (C          | ) 2024 AMI                                                                                          |

#### Native ASPM

Enabled - OS Controlled ASPM. Disabled - BIOS Controlled ASPM.

#### Wake system from S5 via RTC

When Enabled, the system will automatically power up at a designated time every day. Once it's switched to [Enabled], please set up the time of day - hour, minute, and second - for the system to wake up.

#### State After G3

Select between S0 State, and S5 State. This field is used to specify what state the system is set to return to when power is re-applied after a power failure (G3 state).

SO State The system automatically powers on after power failure.

S5 State The system enter soft-off state after power failure. Power-on signal input is

required to power up the system.

Last State The system returns to the last state right before power failure.

#### Advanced

### **CPU Configuration**

| CPU Configuration                    |       | When enabled, a VMM can utilize the additional |
|--------------------------------------|-------|------------------------------------------------|
|                                      |       | hardware capabilities provide                  |
| Technology<br>Active Efficient–cores | [A11] | by Vanderpool Technology.                      |
|                                      |       |                                                |
|                                      |       |                                                |
|                                      |       |                                                |
|                                      |       |                                                |
|                                      |       | ++: Select Screen                              |
|                                      |       | ↑↓: Select Item<br>Enter: Select               |
|                                      |       | +/− : Change Opt.                              |
|                                      |       | F1: General Help<br>F2: Previous Values        |
|                                      |       | F9: Optimized Defaults                         |
|                                      |       | F10: Save & Reset<br>ESC: Exit                 |
|                                      |       |                                                |
|                                      |       |                                                |

#### Intel (VMX) Virtualization Technology

When this field is set to Enabled, the VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

#### **Active Processor Cores**

Select number of cores to enable in each processor package: all or 1.

### **Power & Performance**

| Advanced                                                                                   | Aptio Setup – AMI                           |                                                                                                                                                                                                                                                                                              |
|--------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power & Performance                                                                        |                                             | Power Limit 1 in Milli Watts.                                                                                                                                                                                                                                                                |
| Power Limit 1<br>Power Limit 2<br>Power Limit 1<br>Power Limit 2<br>Turbo Mode<br>C states | 12.0<br>35.0<br>0<br>[Enabled]<br>[Enabled] | 1/6W when programming. 0 = no<br>custom override. For 12.50W,<br>enter 12500, Overclocking SKU:<br>Value must be between Max and<br>Min Power Limits (specified by<br>PACKAGE_POWER_SKU_MSR). Other<br>SKUs: This value must be<br>between Min Power Limit and<br>Processor Base Power (TDP) |
|                                                                                            |                                             | ++: Select Screen<br>11: Select Item<br>Enter: Select<br>+/- : Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F3: Optimized Defaults<br>F10: Save & Reset<br>ESC: Exit                                                                                                            |
| 1                                                                                          | /ersion 2.22.1293 Copyright (C)             | ) 2024 AMI                                                                                                                                                                                                                                                                                   |

#### Advanced

### **PCH-FW Configuration**

| Enable∕Disable Me FW Image<br>Re-Flash function.                                                                                                                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                   |
| ++: Select Screen<br>11: Select Item<br>Enter: Select<br>+/- : Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F9: Optimized Defaults<br>F10: Save & Reset<br>ESC: Exit |
|                                                                                                                                                                                   |

#### **Power Limit**

Pover Limit 1 in MillI Watts. BIOS will round to the nearest 1/8W when programming. 0 = no custom override. For 12.50k, enter 12500. Overclocking SKU: Value must be between Max and Min Pouer Limits (specified by PACKAGE\_POWER\_SKU\_MSR). Other SKUs: This value must be betueen Min Pouer Limit and Processor Base Pouer (TDP)

#### Turbo Mode

Enable or disable turbo mode of the processor. This field will only be displayed when EIST is enabled.

#### C states

Enable or disable CPU Power Management. It allows CPU to enter "C states" when it's idle and nothing is executing.

### Intel (R) Time Coordinated Computing

| Advanced                      |                       |                                                            |
|-------------------------------|-----------------------|------------------------------------------------------------|
| Intel(R) Time Coordinated Com | puting (Intel(R) TCC) | Enable or Disable Alignment<br>Check Exception (#AC). When |
| #AC Split Lock                |                       | enabled, this will assert an                               |
| #GP Fault UC Lock             | [Disabled]            | #AC when any atomic operation                              |
| Intel(R) TCC Authentication M |                       | has an operand that crosses                                |
| Intel(R) TCC Mode             | [Disabled]            | two cache lines.                                           |
|                               |                       |                                                            |
|                               |                       |                                                            |
|                               |                       | ++: Select Screen                                          |
|                               |                       | ↑↓: Select Item                                            |
|                               |                       | Enter: Select                                              |
|                               |                       | +/− : Change Opt.                                          |
|                               |                       | F1: General Help                                           |
|                               |                       | F2: Previous Values<br>F9: Optimized Defaults              |
|                               |                       | F10: Save & Reset                                          |
|                               |                       | ESC: Exit                                                  |
|                               |                       |                                                            |
|                               |                       |                                                            |
|                               |                       |                                                            |
|                               |                       |                                                            |

#### **#AC Split Lock**

Enable or Disable Alignment Check Exception (#AC). When enabled, this will assert an #AC when any atomic operation has an operand that crosses tuo cache lines.

#### **#GP Fault UC Lock**

Enable or Disable GP Fault Exception (GP#). When enabled, this will assert an GP# when encountering a Lock to un-cacheable memory before the bus is locked.

#### Intel (R) TCC Authentication Menu

Intel(R) TCC Authentication Menu options

#### Intel (R) TCC Mode

Enable or Disable Intel(R) TCC Mode. When enabled, this will modify system settings to improve real-time pertormance. The full list of settings and their current state are displayed below when Intel(R)TCC mode is enabled.

#### Advanced

### **Trusted Computing**

| TPM 2.0 Device Found         |            | Enables or Disables BIOS                                   |
|------------------------------|------------|------------------------------------------------------------|
| Firmware Version:<br>Vendor: | 7.2<br>NTC | support for security device<br>0.S. will not show Security |
| vendur:                      | NIC        | Device. TCG EFI protocol ar                                |
| Security Device Support      |            | INTIA interface will not be                                |
| Pending operation            | [None]     | available.                                                 |
|                              | [1010]     |                                                            |
|                              |            |                                                            |
|                              |            |                                                            |
|                              |            |                                                            |
|                              |            |                                                            |
|                              |            |                                                            |
|                              |            |                                                            |
|                              |            | ++: Select Screen                                          |
|                              |            | ↑↓: Select Item                                            |
|                              |            | Enter: Select                                              |
|                              |            | +/- : Change Opt.                                          |
|                              |            | F1: General Help                                           |
|                              |            | F2: Previous Values                                        |
|                              |            | F9: Optimized Defaults<br>F10: Save & Reset                |
|                              |            | ESC: Exit                                                  |
|                              |            | ESU. EXIL                                                  |
|                              |            |                                                            |
|                              |            |                                                            |
|                              |            |                                                            |

#### **Security Device Support**

This field is used to enable or disable BIOS support for the security device such as an TPM 2.0 to achieve hardware-level security via cryptographic keys.

#### **Pending operation**

To clear the existing TPM encryption, select "TPM Clear" and restart the system. This field is not available when "Security Device Support" is disabled.

# IT8786 Super IO Configuration

| Advanced                                                                                  | Aptio Setup – AMI |                                                                                                |
|-------------------------------------------------------------------------------------------|-------------------|------------------------------------------------------------------------------------------------|
| IT8786 Super IO Configuration                                                             |                   | WatchDog Timer Unit Selection                                                                  |
| Super IO Chip                                                                             | IT8786            |                                                                                                |
| WatchDog Timer Unit<br>SuperIO WatchDog Timer<br>Serial Port 1 Configuration              | [Second]<br>O     |                                                                                                |
| Serial Port 2 Configuration<br>Serial Port 3 Configuration<br>Serial Port 4 Configuration |                   |                                                                                                |
|                                                                                           |                   | ++: Select Screen<br>14: Select Item<br>Enter: Select<br>+/- : Change Opt.<br>F1: General Help |
|                                                                                           |                   | F2: Previous Values<br>F9: Optimized Defaults<br>F10: Save & Reset<br>ESC: Exit                |
|                                                                                           |                   |                                                                                                |

### WatchDog Timer Unit

Select WatchDog Timer Unit – Second or Minute.

#### SuperIO WatchDog Timer

Set SuperIO WatchDog Timer Timeout value. The range is from 0 (disabled) to 255.

#### Advanced

### IT8786 Super IO Configuration Serial Port 1,2 Configuration

| Serial Port 1 Configuration                                 |                                         | Enable or Disable Serial Port                                                                                                                                 |
|-------------------------------------------------------------|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Serial Port<br>Device Settings<br>Electrical Interface Mode | (Enabled)<br>IO=3F6h; IRQ=4;<br>(RS232) | (CDH)                                                                                                                                                         |
|                                                             |                                         | ++: Select Screen<br>11; Select Item<br>Enter: Select<br>+/- : Change Opt.<br>F2: Previous Values<br>F3: Optimized Defaults<br>F10: Save & Reset<br>ESC: Exit |

| Advanced                                                    | Aptio Setup – AMI                       |                                                                                                                                                              |
|-------------------------------------------------------------|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Serial Port 2 Configuration                                 |                                         | Enable or Disable Serial Port<br>(COM)                                                                                                                       |
| Serial Port<br>Device Settings<br>Electrical Interface Mode | (Enabled)<br>IO=2FBh; IRQ=3;<br>[RS232] |                                                                                                                                                              |
|                                                             |                                         | +: Select Screen<br>14: Select Tree<br>Enter: Select<br>+/: change Obt.<br>F2: Previous Values<br>F2: Optimized Defaults<br>F3: Optimized Reset<br>ESC: Exit |
| Versio                                                      | on 2.22.1293 Copyright (C) 2            | 2024 AMI                                                                                                                                                     |

#### **Serial Port** Enable or disable serial port.

COM Mode

Choose mode between RS232 / RS485 / RS422

### IT8786 Super IO Configuration **>** Serial Port 3,4 Configuration

| Advanced                                                    | Aptio Setup – AMI                       |                                                                                                                                                                                  |
|-------------------------------------------------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Serial Port 3 Configuration                                 |                                         | Enable or Disable Serial Port<br>(COM)                                                                                                                                           |
| Serial Fort<br>Device Settings<br>Electrical Interface Mode | [Enabled]<br>IO=368h: IRQ=6;<br>[RS282] |                                                                                                                                                                                  |
|                                                             |                                         | 4+: Select Screen<br>II: Select Item<br>Enter: Select<br>+√- : Change Opt.<br>F: General Help<br>F2: Previous Values<br>F3: Optimized Defaults<br>F10: Save & Reset<br>ESC: Exit |
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#### **Serial Port**

Enable or disable serial port.

#### COM Mode

Choose mode between RS232 / RS485 / RS422

#### Advanced

# IT8786 Hardware Monitor

| Advanced                                                                                 |                                                                                                                       |                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pc Health Status                                                                         |                                                                                                                       | Case Open Function                                                                                                                                                                |
| System temperature<br>CPU temperature<br>VCORE<br>+12V<br>5V<br>3V3<br>VBAT<br>Case Open | : +21 %<br>: +31 %<br>: +1.030 V<br>: +1.068 V<br>: +11.302 V<br>: +5.095 V<br>: +3.270 V<br>: +2.943 V<br>[Disabled] |                                                                                                                                                                                   |
|                                                                                          |                                                                                                                       | ++: Select Screen<br>f1: Select Item<br>Enter: Select<br>+/- : Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F9: Optimized Defaults<br>F10: Save & Reset<br>ESC: Exit |

This section displays the system's health information, i.e. voltage readings, CPU and system temperatures, and fan speed readings

### Serial Port Console Redirection

| Advanced                                                      | Aptio Setup – AMI           |                                                                                                                                                                                   |
|---------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| COM4<br>Console Redirection<br>· Console Redirection Settings | [Disabled]                  | Console Redirection Enable or<br>Disable.                                                                                                                                         |
| PCH COM1(Pci Bus0,Dev30,Func0,Port1)<br>Console Redirection   | [Enabled]                   |                                                                                                                                                                                   |
|                                                               |                             | ++: Select Screen<br>14: Select Item<br>Enter: Select<br>+/- : Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F9: Optimized Defaults<br>F10: Save & Reset<br>ESC: Exit |
| Version 2                                                     | .22.1293 Copyright (C) 2024 | 4 AMI                                                                                                                                                                             |

#### **Console Redirection**

Console Redirection Enable or Disable.

#### **Console Redirection Settings** See following pages.

#### Advanced

### Serial Port Console Redirection Console Redirection Settings

| COM4<br>Console Redirection Settings                                                 |                                                           | Emulation: ANSI: Extended<br>ASCII char set. VT100: ASCII                                                                                                                         |
|--------------------------------------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Terminal Type<br>Bits per second<br>Data Bits<br>Parity<br>Stop Bits<br>Flow Control | [VT100Plus]<br>[115200]<br>[8]<br>[None]<br>[1]<br>[None] | char set. VT100Plus: Extends<br>VT100 to support color,<br>function keys, etc. VT-UTF8:<br>Uses UTF8 encoding to map<br>Unicode chars onto 1 or more<br>bytes.                    |
|                                                                                      |                                                           | ++: Select Screen<br>11: Select Item<br>Enter: Select<br>+/- : Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F9: Optimized Defaults<br>F10: Save & Reset<br>ESC: Exit |

Configure the serial settings of the current COM port.

#### Terminal Type

Select terminal type: VT100, VT100+, VT-UTF8 or ANSI.

#### Bits per second

Select serial port transmission speed: 9600, 19200, 38400, 57600 or 115200.

Data Bits Select data bits: 7 bits or 8 bits.

#### Parity

Select parity bits: None, Even, Odd, Mark or Space.

Stop Bits Select stop bits: 1 bit or 2 bits.

Flow Control Select flow control type: None or RTS/CTS.

### Network Stack Configuration

| Advanced                                                                                          | Aptio Setup – AMI                               |                                                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Network Stack<br>IPv4 PXE Support<br>IPv6 PXE Support<br>PXE boot wait time<br>Media detect count | [Enabled]<br>[Disabled]<br>[Disabled]<br>0<br>1 | Enable∕Disable UEFI Network<br>Stack                                                                                                                                              |
|                                                                                                   |                                                 | ++: Select Screen<br>14: Select Item<br>Enter: Select<br>+/- : Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F9: Optimized Defaults<br>F10: Save & Reset<br>ESC: Exit |

#### **Network Stack**

Enable or disable (Default) UEFI network stack. The following fields will appear when this field is enabled.

**Ipv4 PXE Support** Enable or disable IPv4 PXE boot support. If disabled, IPv4 PXE boot support will not be available.

#### Ipv6 PXE Support

Enable or disable IPv6 PXE boot support. If disabled, IPv6 PXE boot support will not be available.

#### PXE boot wait time

Set the wait time in seconds to press ESC key to abort the PXE boot. Use either +/- or numeric keys to set the value.

#### Media detect count

Set the number of times the presence of media will be checked. Use either +/- or numeric keys to set the value.

#### Advanced

### **USB** Power Control

| Advanced                                     | Aptio Setup – AMI                   |                                                                                                                                                                                   |
|----------------------------------------------|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| USB2_1/2 USB3_1<br>USB2_5/6 USB3_2<br>USB2_3 | [5V_Dua1]<br>[5V_Dua1]<br>[5V_Dua1] | 5V_Dual: Support system wake<br>up from S3/S4 by USB KB&MS<br>SV: No support system wake u<br>from S3/S4 by USB KB&MS                                                             |
|                                              |                                     | ++: Select Screen<br>14: Select Item<br>Enter: Select<br>+/- : Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F9: Optimized Defaults<br>F10: Save & Reset<br>ESC: Exit |

#### **USB Power**

5V\_Dual: Support system wake from S3/S4 by USB KB&MS

5V: No Support system wake from S3/S4 by USB KB&MS

| System Agent (SA) Parameters                                                                     |
|--------------------------------------------------------------------------------------------------|
| H+: Select Screen<br>14: Select Item<br>inter: Select<br>∠/- : Change Opt.                       |
| 1: General Help<br>22: Previous Values<br>93: Optimized Defaults<br>10: Save & Reset<br>SC: Exit |
| F                                                                                                |

# Chipset

# System Agnet (SA) Configuration

| Aptio Setu<br>Chipset                                                    | o – AMI                                                                                                                                                                           |
|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| System Agent (SA) Configuration                                          | Memory Configuration Parameters                                                                                                                                                   |
| <ul> <li>Memory Configuration</li> <li>Graphics Configuration</li> </ul> |                                                                                                                                                                                   |
|                                                                          | ++: Select Screen<br>14: Select Item<br>Enter: Select<br>+/- : Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F9: Optimized Defaults<br>F10: Save & Reset<br>ESC: Exit |
| Version 2.22.1293 Cop                                                    |                                                                                                                                                                                   |

Memory Configuration Memory Configuration Parameter.

**Graphics Configuration** Settings about graphic.

### System Agnet (SA) Configuration ► Memory Configuration

| In-Band ECC Support       [Enabled]         In-Band ECC Operation Node       [2]         #11 be enabled if memory has symmetric configuration         **: Select Screen         11: Select Item         Entr: Select Screen         12: Select Item         Entr: Select Screen         **: Select Screen         * | Chipset | Aptio Setup – AMI |                                                                                                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11: Select Item<br>Enter: Select<br>+/-: Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F9: Optimized Defaults<br>F10: Save & Reset                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |         |                   | Will be enabled if memory has                                                                                                                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |         |                   | <pre>11: Select Item<br/>Enter: Select<br/>+/-: Change Opt.<br/>F1: General Help<br/>F2: Previous Values<br/>F9: Optimized Defaults<br/>F10: Save &amp; Reset</pre> |

#### In-Band ECC Support

Enable/Disable In-Band ECC. Either the IBECC or the TME can be enabled.

#### In-Band ECC Operation Mode

- 0: Functional Mode protects requests based on the address range
- 1: Makes all requests non protected and ignore range checks
- 2: Makes all requests protected and ignore range checks

#### Chipset

# System Agnet (SA) Configuration ► Graphics Configuration

| Chipset                              | Aptio Setup – AMI           |                                                                                                                                                                          |
|--------------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Graphics Configuration               |                             | Select which of IGFX/PEG/PCI<br>Graphics device should be                                                                                                                |
| Primary Display<br>Internal Graphics | (Auto)<br>(Auto)            | Primary Display On select HG<br>for Hybrid Gfx.                                                                                                                          |
|                                      |                             | <pre>++: Select Screen 11: Select Item Enter: Select +/- : Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F10: Save &amp; Reset ESC: Exit</pre> |
|                                      | rsion 2.22.1293 Copyright ( |                                                                                                                                                                          |

#### **Primary Display**

Select which of IGFX/PEG/PCH PCI Graphics device should be Primary Display.

#### **Internal Graphics**

Keep IGFX enabled based on the setup options.

# **PCH-IO Configuration**

| Aptio Se<br>Chipset                                                                                     | tup – AMI                                                                                                                                                                         |
|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PCH-IO Configuration<br>► PCI Express Configuration<br>► SATA Configuration<br>► HD Audio Configuration | PCI Express Configuration<br>settings                                                                                                                                             |
|                                                                                                         | ++: Select Screen<br>14: Select Item<br>Enter: Select<br>+/- : Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F9: Optimized Defaults<br>F10: Save & Reset<br>ESC: Exit |
| Version 2.22.1293 C                                                                                     | opyright (C) 2024 AMI                                                                                                                                                             |

#### Chipset

## PCH-IO Configuration PCI Express Configuration

| Chipset                                                                   | tup – AMI                                                                                           |
|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| PCI Express Configuration<br>LAN1<br>LAN2<br>M.2-M<br>M.2-E/M.2-B<br>LAN3 | PCI Express Root Port Settings                                                                      |
|                                                                           | ++: Select Screen<br>14: Select Item<br>Enter: Select<br>+/- : Change Opt.                          |
|                                                                           | F1: General Help<br>F2: Previous Values<br>F9: Optimized Defaults<br>F10: Save & Reset<br>ESC: Exlt |
| Una ing 0,00,1000.0                                                       | apyright (C) 2024 AMI                                                                               |

Select one of the PCI Express channels and press enter to configure the following settings.

LAN1 , LAN2 , LAN3 & M.2-E/ M.2-B, M.2-M

Control the PCI Express Root Port.

#### **PCI Express Configuration**

PCI Express Configuration Settings

#### SATA And RST Configuration

SATA Device Otpions Settings

### **HD Audio Configuration**

HD Audio Subsystem Configuration Settings

### PCH-IO Configuration SATA And RST Configuration

| Chipset                                   | Aptio Setup – AMI         |                                                                                                                                                                                   |
|-------------------------------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SATA Configuration                        |                           | Enable/Disable SATA Device.                                                                                                                                                       |
| SATA Controller(s)<br>SATA Mode Selection | [Enabled]<br>[AHCI]       |                                                                                                                                                                                   |
| M.2-M<br>Port O                           | Empty<br>[Enabled]        |                                                                                                                                                                                   |
|                                           |                           | ++: Select Screen<br>14: Select Item<br>Enter: Select<br>+/- : Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F9: Optimized Defaults<br>F10: Save & Reset<br>ESC: Exit |
| Vers                                      | ion 2.22.1293 Copyright ( | C) 2024 AMT                                                                                                                                                                       |

#### SATA Controller(s)

This field is used to enable or disable the Serial ATA controller.

#### SATA Mode Selection

The mode selection determines how the SATA controller(s) operates.

- AHCI This option allows the Serial ATA controller(s) to use AHCI (Advanced Host Controller Interface).
- Intel RST Premium With Intel Optane System Acceleration This option allows you to create RAID or Intel Rapid Storage configuration along with Intel® Optane<sup>™</sup> system acceleration on Serial ATA devices.
- Ports Enable or disable the Serial ATA port function.

#### Chipset

### PCH-IO Configuration **HD** Audio Configuration

| HD Audio Subsystem Cor | figuration Settings | Control Detection of the<br>HD-Audio device.                                                                                                                                      |
|------------------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                        |                     | HD-Hudio device.<br>Disabled = HOA will be<br>unconditionally disabled<br>Enabled = HDA will be<br>unconditionally enabled.                                                       |
|                        |                     | ++: Select Screen<br>14: Select Item<br>Enter: Select<br>+/- : Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F9: Optimized Defaults<br>F10: Save & Reset<br>ESC: Exit |

#### HD Audio

Control the detection of the HD Audio device.

| Disabled | HDA will be unconditionally disabled. |
|----------|---------------------------------------|
|          |                                       |

Enabled HDA will be unconditionally enabled.

## Security

| Main Advanced Chipset            | Aptio Setup – AMI<br>Security Boot Save & Exit |                                               |
|----------------------------------|------------------------------------------------|-----------------------------------------------|
| Password Description             |                                                | Set Administrator Password                    |
| Minimum length<br>Maximum length | 3<br>20                                        |                                               |
|                                  |                                                |                                               |
| ▶ Secure Boot                    |                                                |                                               |
|                                  |                                                |                                               |
|                                  |                                                |                                               |
|                                  |                                                | ++: Select Screen                             |
|                                  |                                                | †↓: Select Item<br>Enter: Select              |
|                                  |                                                | +/− : Change Opt.<br>F1: General Help         |
|                                  |                                                | F2: Previous Values<br>F9: Optimized Defaults |
|                                  |                                                | F10: Save & Reset                             |
|                                  |                                                | ESC: Exit                                     |
|                                  |                                                |                                               |
|                                  |                                                |                                               |
|                                  | Version 2.22.1293 Copyright                    | (C) 2024 AMI                                  |

#### **Administrator Password**

Set the administrator password. To clear the password, input nothing and press enter when a new password is asked. Administrator Password will be required when entering the BIOS.

#### Security

#### Secure Boot

| Sec                                                                 | Aptio Setup – AMI<br>Surity |                                                                                                                                                                                   |
|---------------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| System Mode                                                         | Setup                       | Secure Boot feature is Activ<br>if Secure Boot is Enabled,                                                                                                                        |
| Secure Boot                                                         | [Disabled]<br>Not Active    | Platform Key(PK) is enrolled<br>and the System is in User mo<br>The mode change requires                                                                                          |
| Secure Boot Mode<br>▶ Restore Factory Keys<br>▶ Reset To Setup Mode | [Custom]                    | platform reset                                                                                                                                                                    |
| ► Key Management                                                    |                             |                                                                                                                                                                                   |
|                                                                     |                             | ++: Select Screen<br>11: Select Item<br>Enter: Select<br>+/- : Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F9: Optimized Defaults<br>F10: Save & Reset<br>ESC: Exit |
| L                                                                   | ersion 2.22.1293 Copyright  | (C) 2024 AMI                                                                                                                                                                      |

#### Secure Boot

Secure Boot feature is Active if secure Boot is Enabled, Platform Key (PK) is enrolled and the system is in user mode. The mode change requires platform reset.

#### Secure Boot Mode

Select the secure boot mode - Standard or Custom. When set to Custom, the following fields will be configurable for the user to manually modify the key database.

#### **Restore Factory Keys**

Force system to User Mode. Load OEM-defined factory defaults of keys and databases onto the Secure Boot. Press Enter and a prompt will show up for you to confirm.

#### **Reset To Setup Mode**

Clear the database from the NVRAM, including all the keys and signatures installed in the Key Management menu. Press Enter and a prompt will show up for you to confirm.

| Boot Configuration<br>Setup Prompt Timeout<br>Bootup NumLock State<br>Quiet Boot<br>EMMC 5.1 Controller<br>DFI OOB Storage | 1<br>[On]<br>[Disabled]<br>[Enabled]<br>[Disabled]                                              | Number of seconds to wait for<br>setup activation key.<br>65535(OxFFF) means indefinite<br>waiting. |
|----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Boot Option Priorities<br>Boot Option #1<br>Boot Option #2                                                                 | [Windows Boot Manager]<br>[UEFI: Generic Flash<br>Disk 8.07, Partition 1<br>(Generic Flash Disk |                                                                                                     |
|                                                                                                                            | 8.07)]                                                                                          | ++: Select Screen<br>11: Select Item<br>Enter: Select<br>+/- : Change Opt.<br>F1: General Help      |
|                                                                                                                            |                                                                                                 | F2: Previous Values<br>F9: Optimized Defaults<br>F10: Save & Reset<br>ESC: Exit                     |

#### Setup Prompt Timeout

Set the number of seconds to wait for the setup activation key. 65535 (0xFFFF) denotes indefinite waiting.

#### **Bootup NumLock State**

Select the keyboard NumLock state: On or Off.

#### **Quiet Boot**

This section is used to enable or disable quiet boot option.

#### **Boot Option Priorities**

Rearrange the system boot order of available boot devices.

# Save & Exit



#### Save Changes and Reset

To save the changes, select this field and then press <Enter>. A dialog box will appear. Select Yes to reset the system after saving all changes made.

#### **Discard Changes and Reset**

To discard the changes, select this field and then press <Enter>. A dialog box will appear. Select Yes to reset the system setup without saving any changes.

#### **Restore Defaults**

To restore and load the optimized default values, select this field and then press <Enter>. A dialog box will appear. Select Yes to restore the default values of all the setup options.

#### **Boot Override**

Move the cursor to an available boot device and press Enter, and then the system will immediately boot from the selected boot device. The Boot Override function will only be effective for the current boot. The "Boot Option Priorities" configured in the Boot menu will not be changed.

#### Save Setting to file

Select this option to save BIOS configuration settings to a USB flash device.

#### Restore Setting from file

This field will appear only when a USB flash device is detected. Select this field to restore setting from the USB flash device.

## Chapter 4 BIOS SETTINGS

### Updating the BIOS

To update the BIOS, you will need the new BIOS file and a flash utility. Please contact technical support or your sales representative for the files and specific instructions about how to update BIOS with the flash utility.

### Notice: BIOS SPI ROM

- The Intel<sup>®</sup> Management Engine has already been integrated into this system board. Due to the safety concerns, the BIOS (SPI ROM) chip cannot be removed from this system board and used on another system board of the same model.
- The BIOS (SPI ROM) on this system board must be the original equipment from the factory and cannot be used to replace one which has been utilized on other system boards.
- 3. If you do not follow the methods above, the Intel® Management Engine will not be updated and will cease to be effective.

## Note:

- a. You can take advantage of flash tools to update the default configuration of the BIOS (SPI ROM) to the latest version anytime.
- b. When the BIOS IC needs to be replaced, you have to populate it properly onto the system board after the EEPROM programmer has been burned and follow the technical person's instructions to confirm that the MAC address should be burned or not.
- After updating unique MAC Address from manufacturing, NVM will be protected immediately after power cycle. Users cannot update NVM or MAC address.

# Chapter 5 - EC700/EC710-ADN Out Of Band Setup

► What's OOB (Out-Of-Band) Management

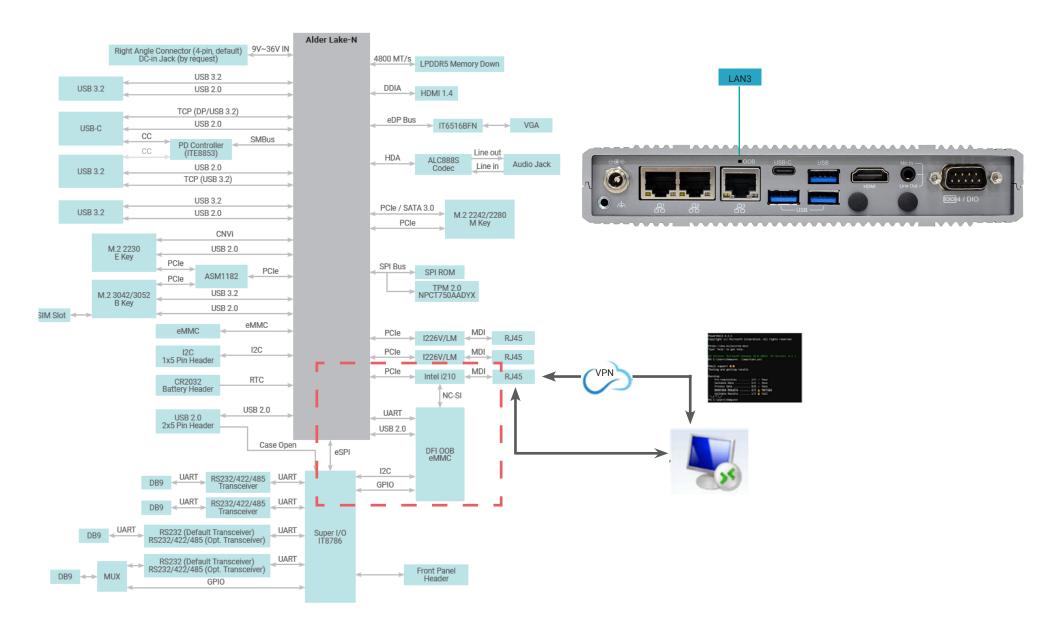
As Industrial IoT demands rise in recent decades, the number of connected IoT devices drastically grow. However, the personnel responsible for equipment maintenance cannot meet the growing numbers of IoT devices; additionally, unexpected factors occur, e.g. the global pandemic. It seems like it is harder to maintain and repair the equipment in a timely manner.

Remote management without running OS. Out-of-band (OOB) technology can timely predict equipment status before the shutdown and efficiently activate OS auto-backup and recovery despite host crashes. Furthermore, the data of device health status are collected automatically to the cloud, and users can easily monitor all connected devices through a customizable UX dashboard.

### ► Key Features

- ► Open SSH login
- Remote power on/off & reset control
- Remote hardware monitor log
- Recovery (Factory Mode)
- Remote BIOS setup & uefi shell (serial over lan)
- Remote BIOS update SPI-NAND
- Remote BIOS update SOL & DFI USB-Storage
- Change OOB IP address

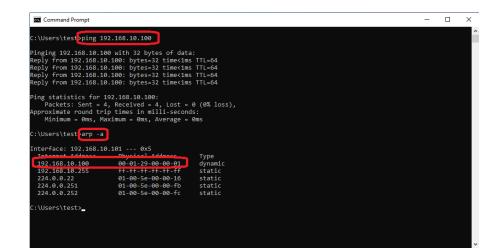
### EC700/EC710-ADN cBMC



## Default Password Setting

#### Step 1:

The default password can be obtained through the "ping" and "arp -a" commands.



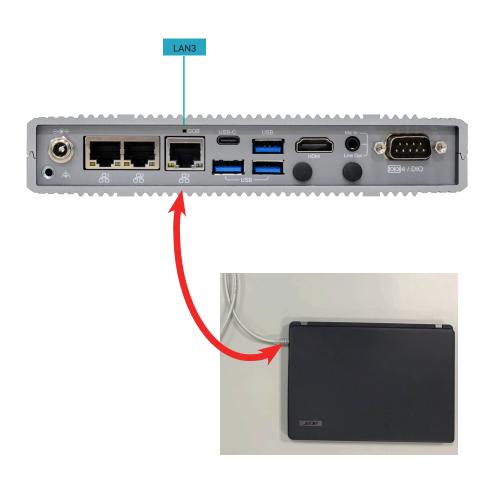
After entering **ping OOB IP address** and execute "**arp -a**" commands, the screen will show OOB MAC address.

The default password is **OOB MAC address -1**. If there are letters from A to F, make sure they are all uppercase letters.

For example 1: 000129000001-1 --> 000129000000 For example 2: 000129110000-1 --> 00012910FFFF

#### Step 2:

Use a LAN cable to connect a LAN port on PC and a LAN port (i210) on the board.

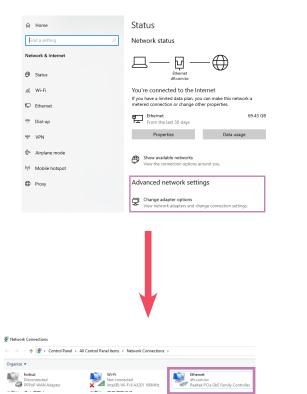


### Step 3: (Please note that this setup is only required for the first time use.)

Setup Lan IP Address - Open Network Status go to Advanced network settings and click Change adapter options, double click Ethernet.

Click **Priorities** - Select **Internet Protocol Version 4 (TCP/IPv4)** and click **Priorities.** Type in the following information, then press **OK**.

IP address: 192.168.10.99 Subnet mask: 255.255.255.0



| 🖗 Ethernet Properties 🛛 🗙                                                                                                                                         | Internet Protocol Version 4 (TCP/IPv4) Properties X                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Networking Sharing                                                                                                                                                | General                                                                                                                                                                             |
| Connect using:                                                                                                                                                    | You can get $IP$ settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate $IP$ settings. |
| Configure This connection uses the following items:                                                                                                               | Obtain an IP address automatically<br>(ii) Use the following IP address:                                                                                                            |
| Glient for Microsoft Networks     File and Printer Sharing for Microsoft Networks                                                                                 | IP address: 192 . 168 . 10 . 99                                                                                                                                                     |
| Gos Packet Scheduler                                                                                                                                              | Subnet mask: 255 . 255 . 255 . 0                                                                                                                                                    |
| Internet Protocol Version 4 (TCP/IPv4)     Microsoft Network Adapter Multiplexor Protocol                                                                         | Default gateway:                                                                                                                                                                    |
| Image: Microsoft LLDP Protocol Driver      Image: Internet Protocol Version 6 (TCP/IPv6)                                                                          | Obtain DNS server address automatically                                                                                                                                             |
| < >                                                                                                                                                               | Use the following DNS server addresses:                                                                                                                                             |
| Install Uninstall Properties                                                                                                                                      | Preferred DNS server:                                                                                                                                                               |
| Description                                                                                                                                                       | Alternate DNS server:                                                                                                                                                               |
| Transmission Control Protocol/Internet Protocol. The default<br>wide area network protocol that provides communication<br>across diverse interconnected networks. | Validate settings upon exit Advanced                                                                                                                                                |
| OK Cancel                                                                                                                                                         | OK Cancel                                                                                                                                                                           |



### Step 4:

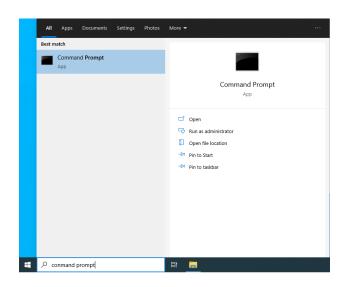
Execute windows Command Prompt.

To run the command prompt:

Pressing Windows key + R key to open "Run" box. Type "cmd" and then click "OK".

Or

■ Using the search bar in the Windows 10, type "cmd" into the search bar and press enter.



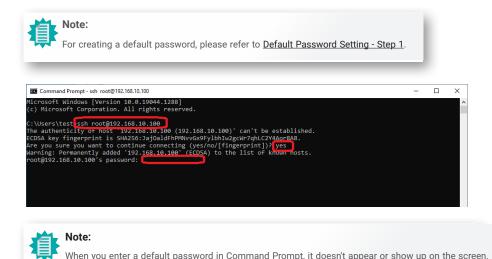
## **Open SSH login**

Please obtain a default password before logging in, and type in the information as follows:

<u>C:\users\user name> :</u> ssh root@192.168.10.100

#### Are you sure you want to continue connecting : yes (This question only appears for the first time login.)

Please go to the next page for how to use SSH key pair to log in without entering a password.



When you enter a default password in Command Prompt, it doesn't appear or show up on the screen.

After entering the password, you will see  $\sim #$ 

Then type in cd DFI.

When it displays **/DFI #**, you may now start typing in commands for each function.

| Gen OpenSSH SSH client                                                                         | - | $\times$ |
|------------------------------------------------------------------------------------------------|---|----------|
| dicrosoft Windows [Version 10.0.19045.3448]<br>(c) Microsoft Corporation. All rights reserved. |   | î        |
| C:\Users\yili.pan>ssh root@192.168.10.100                                                      |   |          |
| ~ # cd DPI<br>/DFI #                                                                           |   |          |
|                                                                                                |   |          |
|                                                                                                |   |          |
|                                                                                                |   |          |
|                                                                                                |   |          |

## Use SSH key Pair Login

#### Step 1:

Execute windows Command Prompt.

To run the command prompt:

Pressing Windows key + R key to open "Run" box. Type "cmd" and then click "OK".

Or

Using the search bar in the Windows 10, type "cmd" into the search bar and press enter.

Please enter the command as follows: C:\users\user name> : ssh-keygen

The file will be saved in C:\users\user name\.ssh folder.



| This | s PC → Local Disk (G | C:) → Users → test → | .ssh          |          | √ Ū  | Search .ssh | Ą |
|------|----------------------|----------------------|---------------|----------|------|-------------|---|
| ^    | Name                 | ^                    | Date modified | Туре     | Size |             |   |
|      | id_rsa               |                      |               | File     |      | 3 KB        |   |
|      | 🥘 id_rsa.pub         |                      |               | PUB File |      | 1 KB        |   |

### Step 2:

Please obtain a default password before logging in, and type in the information as follows: C:\users\user name> : ssh root@192.168.10.100 "mkdir -p ~/.ssh && chmod 700 ~/.ssh"

#### Are you sure you want to continue connecting : yes

(This question only appears for the first time log in)



#### • For creating a default password, please refer to Default Password Setting - Step 1.

• When you enter a default password in Command Prompt, it doesn't appear or show up on the screen.



### Step 3:

Please enter the command as follows:

#### scp C:\Users\test\.ssh\id\_rsa.pub root@192.168.10.100:~/.ssh/authorized\_keys

And then enter the password.

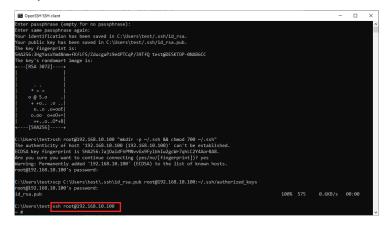


#### Step 4:

Please enter the command as follows: ssh root@192.168.10.100

It will log in automatically, no need to enter any password.

#### And then you will see ~#



• Use SSH key Pair Login - Change A Path and Create A Filename

You can also type in a path location where you want to save the file and create a file name. For example :

Please enter the command as follows: ssh-keygen -f C:\Users\test\.ssh\a4-1c-b4-0a-b0-6a The file will be located in C:\users\test folder. The file name is a4-1c-b4-0a-b0-6a.

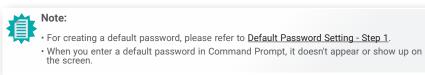
| crosoft Windows [Version 10.0.19044.4529]                                                               |                              |  |
|---------------------------------------------------------------------------------------------------------|------------------------------|--|
| :) Microsoft Corporation. All rights reserved.                                                          |                              |  |
| \Users\test>ssh-keygen -f C:\Users\test\.ssh\a4-                                                        | 1c-b4-0a-b0-6a               |  |
| enerating public/private rsa key pair.                                                                  |                              |  |
| ter passphrase (empty for no passphrase): ————————————————————————————————————                          | Press Enter                  |  |
| nter same passphrase again:<br>our identification has been saved in C:\Users\tes                        |                              |  |
| our identification has been saved in C:\Users\test<br>our public key has been saved in C:\Users\test\.s |                              |  |
| he key fingerprint is:                                                                                  | 311 (84-10-04-04-00-08. publ |  |
| A256:IV8SU7X2omKYT92j127gbBdkydsDdnA4BaFiZVxK2zk                                                        | test@DESKTOP-0NAB6CC         |  |
| ne key's randomart image is:                                                                            |                              |  |
| [RSA 3072]+                                                                                             |                              |  |
| 0.0=0+=.                                                                                                |                              |  |
| 0+.==  <br>. 00.+0E+.                                                                                   |                              |  |
| 0.+ +*.                                                                                                 |                              |  |
| S 00+0                                                                                                  |                              |  |
|                                                                                                         |                              |  |
| 0 + 0000                                                                                                |                              |  |
|                                                                                                         |                              |  |
| o +.  <br>[SHA256]+                                                                                     |                              |  |
| [3114230]+                                                                                              |                              |  |
| \Users\test>                                                                                            |                              |  |
|                                                                                                         |                              |  |
|                                                                                                         |                              |  |
|                                                                                                         |                              |  |
|                                                                                                         |                              |  |
|                                                                                                         |                              |  |

| This | sPC → Local Disk (C:) → Users → test | > .ssh        |          | ~ Ö  | Search .ssh | Q |
|------|--------------------------------------|---------------|----------|------|-------------|---|
| ^    | Name                                 | Date modified | Туре     | Size |             |   |
|      | а4-1с-b4-0а-b0-ба                    |               | File     |      | 3 KB        |   |
|      | 🥅 a4-1c-b4-0a-b0-6a.pub              |               | PUB File |      | 1 KB        |   |

### Step 1:

Please obtain a default password before logging in, and type in the information as follows: C:\users\user name> : ssh root@192.168.10.100 "mkdir -p ~/.ssh && chmod 700 ~/.ssh"

# Are you sure you want to continue connecting : yes (This question only appears for the first time log in)



| SS Command Prompt                                                                          | - | × |  |
|--------------------------------------------------------------------------------------------|---|---|--|
| Microsoft Windows [Version 10.0.19044.4529]                                                |   | ^ |  |
| (c) Microsoft Corporation. All rights reserved.                                            |   |   |  |
|                                                                                            |   |   |  |
| C:\Users\test>ssh-kevgen -f C:\Users\test\.ssh\a4-1c-b4-0a-b0-6a                           |   |   |  |
| Generating public/private rsa key pair.                                                    |   |   |  |
| Enter passphrase (empty for no passphrase):                                                |   |   |  |
| Enter same passphrase again:                                                               |   |   |  |
| Your identification has been saved in C:\Users\test\.ssh\a4-1c-b4-0a-b0-6a.                |   |   |  |
| Your public key has been saved in C:\Users\test\.ssh\a4-1c-b4-0a-b0-6a.pub.                |   |   |  |
| The key fingerprint is:                                                                    |   |   |  |
| SHA256;IV8SU7X2omKYT92i127gbBdkydsDdnA4BaFiZVxK2zk test@DESKTOP-@NAB6CC                    |   |   |  |
| The key's randomart image is:                                                              |   |   |  |
| +[RSA 3072]+                                                                               |   |   |  |
| 0.0-0+=.                                                                                   |   |   |  |
| 0+.==                                                                                      |   |   |  |
| . oo.+oE+.                                                                                 |   |   |  |
| 0.+ +*.                                                                                    |   |   |  |
| S 00+0                                                                                     |   |   |  |
| 0.0.0.                                                                                     |   |   |  |
| 0 + 0000                                                                                   |   |   |  |
| +=.+                                                                                       |   |   |  |
| 0 +.                                                                                       |   |   |  |
| +[SHA256]+                                                                                 |   |   |  |
|                                                                                            |   |   |  |
| C:\Users\test>ssh root@192.168.10.100 "mkdir -p ~/.ssh && chmod 700 ~/.ssh"                |   |   |  |
| The authentici <del>ty of nost 192.106.10.100 (192.108.10.100)</del> can t be established. |   |   |  |
| ECDSA key fingerprint is SHA256:JajOaldFhPMWvvGx9FylbhIw2gcWr7qhLC2Y <u>4Aor8</u> A8.      |   |   |  |
| Are you sure you want to continue connecting (yes/no/[fingerprint]) yes                    |   |   |  |
| Warning: Permanently added '192. <u>168.10.100' (ECD</u> SA) to the list of known hosts.   |   |   |  |
| root@192.168.10.100's password:                                                            |   |   |  |
|                                                                                            |   |   |  |
| C:\Users\test>                                                                             |   |   |  |

#### Step 2:

Please enter the command as follows:

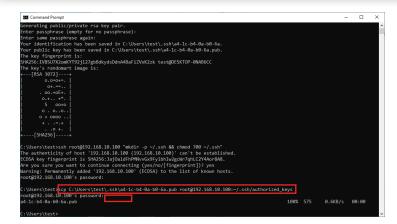
#### scp C:\Users\test\.ssh\a4-1c-b4-0a-b0-6a. pub root@192.168.10.100:~/.ssh/authorized\_keys

And then enter the password.



### • For creating a default password, please refer to Default Password Setting - Step 1.

When you enter a default password in Command Prompt, it doesn't appear or show up on the screen.



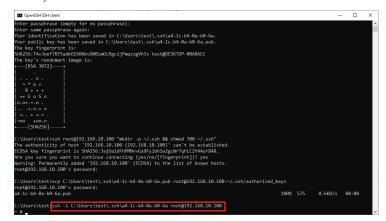
#### Step 3:

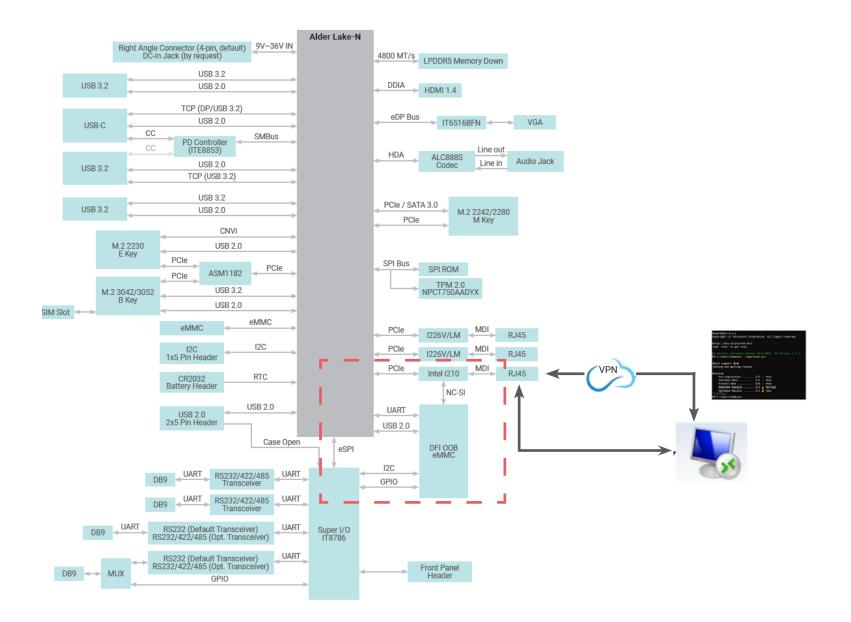
Please enter the command as follows:

ssh -i C:\Users\test\.ssh\a4-1c-b4-0a-b0-6a root@192.168.10.100

It will log in automatically, no need to enter any password.

And then you will see ~#

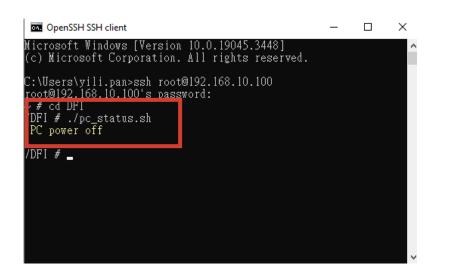




### PC Power On/Off Status Check

Please complete <u>Default Password Setting - Step 4</u> before entering the following command. Check the current power On/Off status remotely by typing in following command.

#### Shell Script : ./pc\_status.sh



### Turn On/Off PC Remotely

After the status check, you can control PC power on/off remotely. Please complete <u>Default Password Setting - Step 4</u> before entering the following command. To toggle power on or power off, just type in the same command again.

### Shell Script : ./power\_button.sh



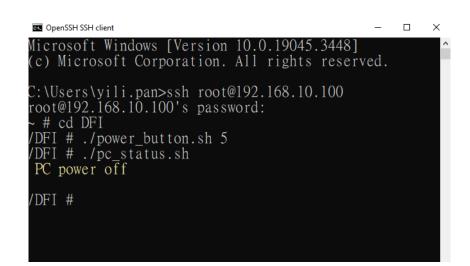
2. Type in shell script: ./power\_button.sh to power on or power off the PC.

3. Then check the staus again.

### Perform a Timed Force Shutdown

To forcibly shut down the PC, please type in the following command. Please complete <u>Default Password Setting - Step 4</u> before entering the following command. Numbers means this will force shutdown your PC in xx seconds (waiting time). Setting it to 5 will shutdown your PC after 5 seconds.

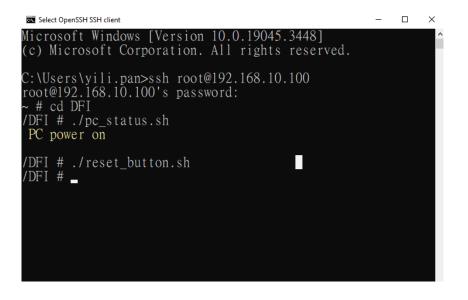
### Shell Script : ./power\_button.sh 5



### PC Rebooting

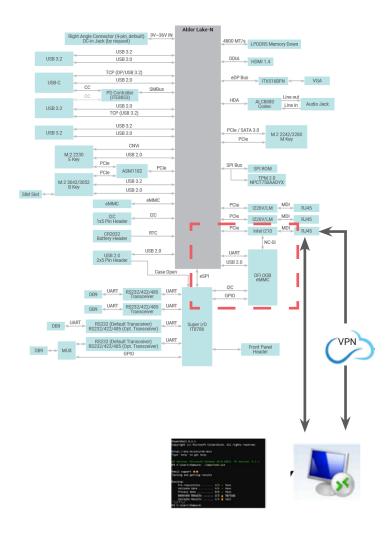
To reboot the PC, please type in the following command. You will hear a single beep, it means PC rebooted successfully. Please complete <u>Default Password Setting - Step 4</u> before entering the following command.

#### Shell Script : ./reset\_button.sh



## Remote Hardware Monitor Log (Super I/O)

I2C bus: Super I/O: Voltage, Temperature, Fan Speed PCH: CPU Temperature



### Super I/O Log

To start/stop super I/O log, please type in the following commands. Please complete <u>Default Password Setting - Step 4</u> before entering the following command.

To start super I/O log: Shell Script : **./sio\_start\_log.sh YYYY-MM-DD hh:mm:ss hours /DFI/sio\_log &** For example: ./sio\_start\_log.sh 2024-05-24 09:00:00:00 24 /DFI/sio\_log & Make sure to add the ampersand "&" at the end to run in the background.



<u>To stop super I/O log:</u> Shell Script : **./sio\_stop\_log.sh** 

DFI # ./sio\_stop\_log.sh

= DFI OOB === ]+ Terminated

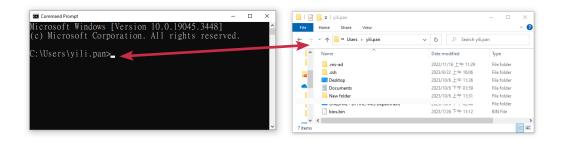
/DFI #

./sio\_start\_log.sh 2024-05-24 09:00:00 24 /DFI/sio\_log

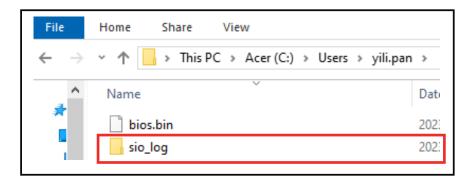
### How to Export Super I/O Logs From OOB

To export super I/O log, please type in the following command. Please complete <u>Default Password Setting - Step 4</u> before entering the following command.

Shell Script : **scp -r root@192.168.10.100:/DFI/sio\_log C:\Users\username\.ssh** For example: scp -r root@192.168.10.100:/DFI/sio\_log C:\Users\yili.pan\.ssh



The log file is saved in C drive.



## ► Using USB Storage / MicroSD Card to run actions

### The shell scripts for USB storage

Please execute the following commands to switch between the USB flash drive and the microSD card for the device operations.

To insert a USB flash drive, please execute a shell script as following: Shell Script : **./insert\_usb\_storage.sh** 

To remove a USB flash drive, please execute a shell script as following: Shell Script : **./eject\_usb\_storage.sh** 

To format a USB flash drive to factory settings, please execute a shell script as following: Shell Script : **./format\_usb\_storage.sh** 

If file operations are performed via a USB flash drive under OOB, need to refresh windows to update. To update a USB flash drive, please execute a shell script as following: Shell Script : **./refresh\_usb\_storage.sh** 

### The shell scripts for MicroSD card

Please format your MicroSD card to FAT32 before executing any commands, and then insert it into the OOB MicroSD card slot.

There are two ways to format a MicroSD card :

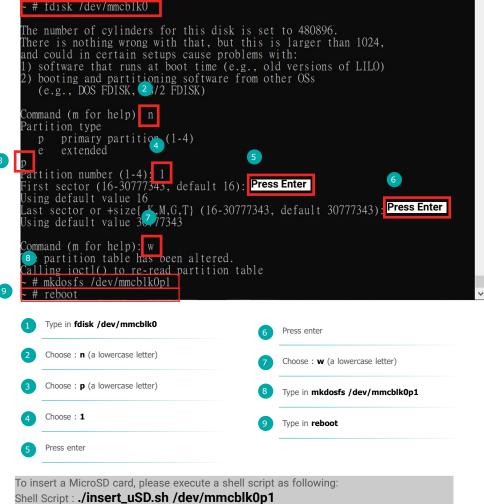
- 1. You can format a microSD card using your Windows computer. Make sure that once you have formatted, your card will be formatted to FAT32 filesystem type.
- 2. You can format a micro SD card using commands.

### Formatting a microSD Card under OOB

Please format a MicroSD card before using it to log in OOB. What are the situations do you need to format a MicroSD card :

- A brand new MicroSD card.
- Your MicorSD card is not formatted as FAT32.

The instructions are as follows :

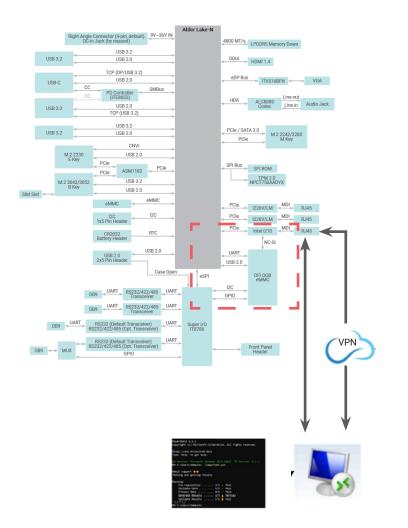


To remove a MicroSD card, please execute a shell script as following: Shell Script : **./eject\_uSD.sh** 

If file operations are performed via a MicroSD card under OOB, need to refresh windows to update. To update a USB flash drive, please execute a shell script as following: Shell Script : **./refresh\_uSD.sh /dev/mmcblk0p1** 

### ► BIOS

### Remote BIOS Update



#### Step 1:

Before starting the update, you will have to prepare BIOS bin file.

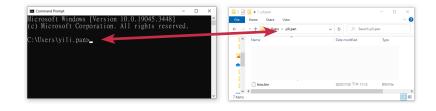
**BIOS bin file** (Every BIOS file has a different file name to be used as a command, please enter the file name accordingly.) How to request to obtain the files and update BIOS, please watch the video below for more information:

#### https://www.dfi.com/tw/knowledge/video/5



#### Step 2:

Copy BIOS bin file to its corresponding users folder in C drive.



#### Step 3:

Open command prompt and type in the command below. Every BIOS file has a different file name used as a command, please enter the file name accordingly.

Shell Script : scp bios.bin file name root@192.168.10.100:~/DFI/bios/

## For example: BIOS file name : B246.18A

Shell Script : scp B246.18A root@192.168.10.100:~/DFI/bios/

### C:\Users\test>scp B246.18A root@192.168.10.100:~/DFI/bios/

Please enter a default password. root@192.168.10.100's password:

Note:

**İ** For creating a default password, please refer to Default Password Setting - Step 1.

Refresh DFI USB storage to notify windows

Shell Script : ssh root@192.168.10.100 ./DFI/refresh\_usb\_storage.sh

### :\Users\test≻ssh root@192.168.10.100 ./DFI/refresh usb storage.sh root@192.168.10.100's password:

=== DFI 00B ===

C:\Users\test>

#### Step 4:

Run SSH command: Please type in the information as follows:

<u>C:\users\user name> :</u> ssh root@192.168.10.100

#### Are you sure you want to continue connecting : yes (This question only appears for the first time log in)

root@192.168.10.100's password: For creating a default password, please refer to Default Password Setting - Step 1.

After entering the password, you will see ~# Then type in cd /DFI/bios/

#### Step 5:

For the next step, you will have to shut down the PC if the power is still on. To turn off the pc, enter **cd** .. to go back one level. Type in ./power\_button.sh to execute shutdown. Then type in **cd bios/** and the final step, type in /DFI/bios #./update\_bios.sh BIOS bin file name to begin the BIOS update.

Enter the following command to start updating BIOS:

Shell Script : ./updatebios.sh bios bin file name For example: BIOS file name : B246.18A Shell Script : ./updatebios.sh B246.18A

OpenSSH SSH clien

icrosoft Windows [Version 10.0.19045.3448] c) Microsoft Corporation. All rights reserved.

2:\Users\yili.pan>ssh root@192.168.10.100 root@192.168.10.100's password: # cd DFI/bios/. DFI/bios # ./updatebios.sh B246.18A

/DFI/bios # cd .. /DFI # ./power\_button.sh DFI # cd bios7 DFI/bios # ./updatebios.sh **B246.18A** 

= DFI 00B ==== sing clock\_gettime for delay loops (clk\_id: 1, resolution: lns). vobing protocols are supported: SPI. robing for Winbond W25Q256IV\_Q, 32768 kB: compare\_id: idl 0xef, id2 0x4019 ound Winbond flash chip "W25Q256JV\_Q" (32768 kB, SPI) on linux\_spi. hip status register is 0x00.

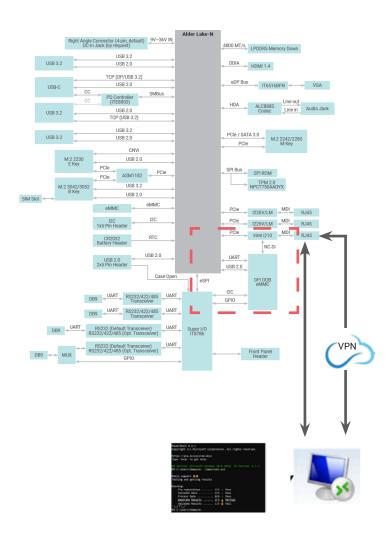
lease wait...

Reading old flash chip contents... Reading old flash chip contents... done. Brasing and writing flash chip... ..... Verifying flash... VERIFIED.

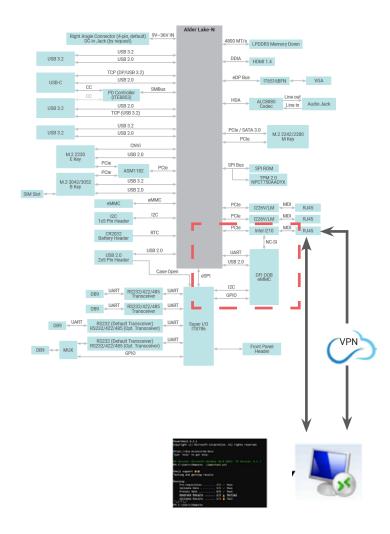
/DFI/bios # 🗕

### Remote BIOS Update (Via Teraterm)

### • Remote BIOS Setup & UEFI shell (Serial Over Lan)



• Remote BIOS Update (SOL & DFI USB-Storage)



## Check BIOS Set Up from USB Storage

Before starting BIOS update, please make sure the BIOS set up is on USB storage.

To check BIOS set up, please execute a shell script as following: Shell Script : **./insert\_usb\_storage.sh** If BIOS set up is on USB storage, it shows **USB Storage is exist, Please eject it.** 

/DFI # /DFI # ./insert\_usb\_storage.sh

```
USB Storage is exist, Please eject it
```

If BIOS set up is on MircoSD, it shows **This is USB uSD, Please execute eject\_uSD.sh.** and execute **./eject\_uSD.sh** and then execute **./insert\_usb\_storage.sh** 

/DFI # ./eject\_usb\_storage.sh

This is USB uSD, Please exec eject\_uSD.sh

/DFI # ./eject\_uSD.sh /DFI # ./insert\_usb\_storage.sh /DFI #

### Step 1:

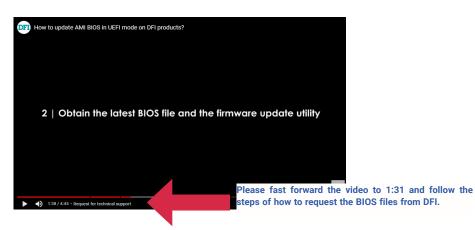
Before starting the update, you will have to prepare two files:

1. AfuEfiU64.efi

2. BIOS bin file

How to request to obtain the files and update BIOS, please watch the video below for more information:

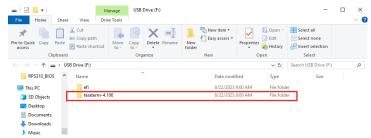
#### https://www.dfi.com/tw/knowledge/video/5



### Step 2:

TeraTerm is already included in the DFI system.

After successfully booting to OOB, you will see a USB flash drive in the DFI system. Please copy the teraterm folder from the USB flash drive to the computer where you want to operate the OOB.



Go to Teraterm folder and open **telnet.bat.** Press "**ESC**" key ,when system power on.

Run SSH command:

Please type in the information as follows:

 <u>Copy BIOS from local PC to remote OOB module</u> scp AfuEfiU64.efi root@192.168.10.100:~/DFI/USB/files scp bios.bin file name root@192.168.10.100:~/DFI/USB/files Shell Script : scp bios.bin file name root@192.168.10.100:~/DFI/USB/files

### For example:

BIOS file name : B246.18A Shell Script : scp B246.18A root@192.168.10.100:~/DFI/USB/files

Shell Script : scp AfuEfiU64.efi root@192.168.10.100:~/DFI/USB/files

| C:\Usars\test>scp <b>B246.18A</b> root@192.168.10.100:/DFI/US8/files<br>root@192.168.10.100`s password:<br><b>B246.18A</b>            | 100% | 32MB  | 953.4KB/s | 00:34 |
|---------------------------------------------------------------------------------------------------------------------------------------|------|-------|-----------|-------|
| C:\Users\test>scp <b>AfuEfiU64.ef</b> i root@192.168.10.100:/DFI/USB/files<br>root@192.168.10.100's password:<br><b>AfuEfiU64.efi</b> | 100% | 606KB | 554.6KB/s | 00:01 |
| C:\Users\test>                                                                                                                        |      |       |           |       |

Refresh DFI USB storage to notify windows

C:\Users\test>ssh root@192.168.10.100 ./DFI/refresh\_usb\_storage.sh root@192.168.10.100's password:

=== DFI 00B ===

C:\Users\test>

How to Access BIOS Setup Menu When Power on

If the DFI system is power on which installed OOB, executing **power\_button.sh** script to off/on the system. The script must be executed twice, first is for powering off the system, second is for powering on the system.

After the first execution, check if the system status is power off, then proceed with the second execution to be able to enter BIOS setup menu.

For the baud rate setting change, please input the shell script below to choose from 115200 or 921600. Make sure the baud rate setting from BIOS console redirection is matched.

### Shell Script : ./setbaudrate.sh For example: baud rate : 921600 Shell Script : ./setbaudrate.sh 921600

#

/ # cd DFI/ 'DFI # ./setbaudrate.sh 921600 'DFI #

### Step 3:

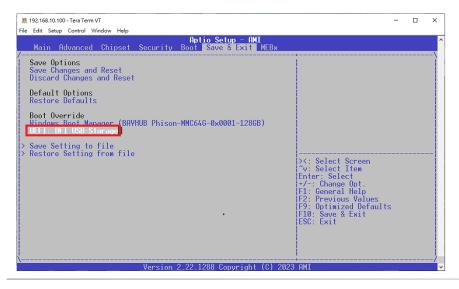
Access BIOS setup menu.

When system power is on, press "ESC" key in the teraterm window.

| Main Advanced Chipset Securit                                                                                                                                                                      | Aptio Setup - AMI<br>y Boot Save & Exit MEBx                                                                                              |                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product Name<br>BIOS Version<br>FSP version<br>RC version<br>13th Gen Intel(R) Core(TM) i7-137<br>JD<br>Stepping<br>Number of Efficient-cores<br>Number of Performance-cores<br>Microcode Revision | RPS630<br>B236.01A_UART2<br>0C.00.9D.20<br>0C.E0.9D.20<br>00TE<br>0xB0671<br>B0<br>8Core(s) / 8Thread(s)<br>8Core(s) / 16Thread(s)<br>112 | Set the Date. Use Tab to<br>Switch between Date elements.<br>Default Ranges:<br>Year: 1998-9999<br>Months: 1-12<br>Days: Dependent on month Range<br>of Years may vary.         |
| Memory RC Version<br>Total Memory<br>Memory Frequency<br>PCH SKU<br>ME FW Version<br>ME Firmware SKU<br>PMC FH Version<br>System Date<br>System Time                                               | 0.0.4.112<br>16384 MB<br>4000 MHz<br>PCH-S R680E<br>16.1.25.2101<br>Corporate SKU<br>160.2.0.1041<br>[Tue 05/22/2023]<br>[06:10:57]       | ><: Select Screen<br>'v: Select Item<br>Enter: Select<br>+/-: Change Opt.<br>F1: General Help<br>F2: Previous Values<br>F9: Optimized Defaults<br>F10: Save & Exit<br>ESC: Exit |

Boot from DFI USB-Storage device & Update BIOS in uefi mode.

Use arrow key to select Save & Exit ---> UEFI: DFI USB-Storage



### Step 4:

Please contact technical support or your sales representative for the files and specific instructions about how to update BIOS with the flash utility.

When there is no error message displayed, the BIOS update will be completed successfully.

| Pc:Root(0x0//Pc:(0x14,0x0//0SB(0x3,0x0)<br>blk0 :HardDisk - Alias hd3/b fs0<br>Pc:Root(0x0)/Pc:(0x10,0x4)/Pc:(0x0,0x0)/NVNe(0x1,41-44-F6-05-52-48-35-7<br>C)/HD(1.6PT,9017F1AF-37E4-4654-98CF)-E74BE3857A9E,0x800,0x32000)<br>blk1 :Removable BlockDevice - Alias f18d0 fs1<br>Pc:Root(0x0)/Pc:(0x14,0x0)/USB(0x3,0x0)<br>blk2 :HardDisk - Alias (null)<br>Pc:Dot(0x0)/Pc:(0x14,0x0)/USB(0x3,0x0)<br>blk2 :HardDisk - Alias (null)            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PciRoot(0x0)/Pci(0x10,0x4)/Pci(0x0,0x0)/NVNe(0x1,41-44-F6-05-52-48-35-7<br>C)/HD(2,GPT,87646C9-E547-45F4-9A9F-114CBAB8F322,0x32800,0x40000)<br>blk3 :HardDisk - Alias (null)<br>PciRoot(0x0)/Pci(0x10,0x4)/Pci(0x0,0x0)/NVNe(0x1,41-44-F6-05-52-48-35-7<br>C)/HD(3,GP1,7093H5E-E9HD-4CCC-H12B-3H56AB6C0DBE,0x72800,0x1DC80800)<br>blk4 :BlockDevice - Alias (null)<br>PciRoot(0x0)/Pci(0x10,0x4)/Pci(0x0,0x0)/NVNe(0x1,41-44-F6-05-52-48-35-7 |
| C)<br>Press <b>ESC</b> in 3 seconds to skip <b>startup.nsh</b> , any other key to continue.<br>startup.nsh≻ fs1:<br>startup.nsh≻ Afuefiu.efi bios.bin /p /b /n /reboot                                                                                                                                                                                                                                                                        |
| AMI Firmware Update Utility v5.15.03.0081<br>Copyright (c) 1985-2022, American Megatrends International LLC.<br>All rights reserved. Subject to INI licensing agreement.<br>Reading flash                                                                                                                                                                                                                                                     |

### OOB IP Address Change

### SSH

#### Step 1:

Execute windows Command Prompt.

To run the command prompt:

Pressing Windows key + R key to open "Run" box. Type "cmd" and then click "OK". Or

Using the search bar in the Windows 10, type "cmd" into the search bar and press enter.

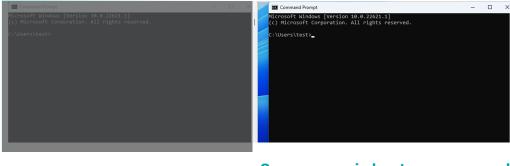
Typing in following command and you will see a message to ask for a new IP address.

(For example: 192.168.10.88)

### Shell Script : ssh root@192.168.10.100 ./DFI/ipconfig.sh



Press Enter and close the current window since it is frozen and unable to operate. Please open a new window to login new IP address and run command prompts. After the network changes, make sure it should be in the same network domain as OOB.



Close a frozen window \_\_\_\_\_

Open a new window to run command prompts with new IP address.

#### Step 2:

In the new command prompts window, login to OOB with SSH ssh root@(Input new IP address)

### Shell Script : ssh root@192.168.10.88

#### :\Users\test>ssh root@192.168.10.88

The authenticity of nost 192.168.10.88 (192.168.10.88)' can't be established. ECDSA key fingerprint is SHA256:JajOaldFhPMNvvGx9Fylbhlw2gcWr7qhLC2Y4Aor8A8. Are you sure you want to continue connecting (yes/no/[fingerprint])? yes Warning: Permanently added '192.168.10.88' (ECDSA) to the list of known hosts. root@192.168.10.88's password:

## **Console Redirection**

### Step 1:

After the IP address changes, Console Redirection is unable to run commands. To fix the problme, please navigate to **C:\Program Files (x86)\teraterm** to look for a TTL file named '**telnet.ttl**.' This file needs to be modified. After that, Console Redirection has been updated successfully.

| teraterm                  |                                   |                              |                    |                    | - |  |
|---------------------------|-----------------------------------|------------------------------|--------------------|--------------------|---|--|
| 🕂 New - 🏑                 | 0 🗋 🕸 🖻                           |                              |                    |                    |   |  |
| ← → ~ ↑ 📮                 | > This PC > Local Disk (C:) > Pre | ogram Files (x86) > teraterm | ~ C                | Q. Search teraterm |   |  |
| - 合 Home                  | Name                              | Date modified                | Туре               | Size               |   |  |
|                           | 🚯 telnet.bat                      | 9/5/2023 7:05 AM             | Windows Batch File | 1 KB               |   |  |
| 🛄 Desktop 🛛 🖈             | 🔄 TELNET.INI                      | 9/5/2023 7:05 AM             | Configuration sett | 25 KB              |   |  |
| 🛓 Downloads 🛛 🖈           | itelnet.ttl                       | 11/30/2023 6:48 PM           | TTL File           | 1 KE               |   |  |
| 📔 Documents 🛛 🖈           | TelnetKB.CNF                      | 9/5/2023 7:05 AM             | CNF File           | 5 KB               |   |  |
| 🔀 Pictures 🛛 🖈            | 👔 teraterm.chm                    | 5/31/2021 9:34 PM            | Compiled HTML      | 2,242 KB           |   |  |
| 📥 OneDrive                | TERATERM.INI                      | 2/6/2025 6:11 PM             | Configuration sett | 25 KB              |   |  |
| This PC                   | 😭 teratermj.chm                   | 5/31/2021 9:34 PM            | Compiled HTML      | 2,178 KB           |   |  |
| ~                         | 💻 ttermpro.exe                    | 5/31/2021 9:35 PM            | Application        | 1,756 KB           |   |  |
| USB Drive (D:)            | ttpcmn.dll                        | 5/31/2021 9:34 PM            | Application exten  | 272 KB             |   |  |
| 🛬 Network                 | stpfile.dll                       | 5/31/2021 9:34 PM            | Application exten  | 252 KB             |   |  |
|                           | ttpmacro.exe                      | 5/31/2021 9:34 PM            | Application        | 1,432 KB           |   |  |
|                           | 🚯 ttpset.dll                      | 5/31/2021 9:34 PM            | Application exten  | 216 KB             |   |  |
|                           | 🗟 ttptek.dll                      | 5/31/2021 9:34 PM            | Application exten  | 228 KB             |   |  |
|                           | TTXProxy.dll                      | 5/31/2021 9:35 PM            | Application exten  | 296 KB             |   |  |
| 5 items   1 item selected |                                   |                              |                    |                    |   |  |

### The old IP address

show 0

connect '192.168.10.100:50005 /nossh /T=1'

:detpwd

loadkeymap 'TelnetKB.CNF'

wait "Enter Password"

testlink

if result=0 then mpause 200 end

### Change to the new IP address

show 0

connect '192.168.10.88:50005 /nossh /T=1'

:detpwd

loadkeymap 'TelnetKB.CNF'

wait "Enter Password"

testlink

if result=0 then mpause 200 end endif

loadkeymap 'KEYBOARD.CNF'