PI900F

Intel® Core™ Ultra 100U
PICO-ITX Motherboard

User's Manual

Version 1.0
(May 2026)

iBASE

Compliance

CE

This product complies with CE Class B requirements for environmental specifications and limits. This product is in accordance with the directives of the European Union (EU). In a domestic environment, this product may cause radio interference in which case users may be required to take adequate measures.

FC

This product has been tested and found to comply with the limits for a Class B device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instructions, may cause harmful interference to radio communications.

Warranty Policy

- **IBASE standard products:**

  24-month (2-year) warranty from the date of shipment. If the date of shipment cannot be ascertained, the product serial numbers can be used to determine the approximate shipping date.

- **Third-party parts:**

  12-month (1-year) warranty from delivery for the third-party parts that are not manufactured by IBASE, such as CPU, CPU cooler, memory, storage devices, power adapter, panel and touchscreen.

- ***Products that fail due to misuse, accident, improper installation or unauthorized repair will be treated as out of warranty and customers will be billed for repair and shipping charges.***

Technical Support & Services

1. Visit the IBASE website at www.ibase.com.tw to find the latest information about the product.
2. Contact your distributor or sales representative for technical support. Provide the following information:
   - Product model name and serial number
   - Detailed description of the problem
   - Any error messages, either in text or screenshots
   - Connected peripherals and configuration
   - Software in use (such as OS and application software, including the version numbers)
3. If repair (RMA) service is required, please visit the support page of the IBASE website to review the warranty and RMA policy, and related procedures.

WEEE

This product must not be disposed of as normal household waste, in accordance with the EU directive for waste electrical and electronic equipment (WEEE - 2012/19/EU). Instead, it should be disposed of by returning it to a recycling collection point. Please check local regulations for disposal of electronic products.

Green IBASE

This product complies with RoHS 2 restrictions, which prohibit the use of certain hazardous substances in electrical and electronic equipment. The following substances must not exceed the specified concentrations:

- Hexavalent chromium: 1,000 ppm
- Poly-brominated biphenyls (PBBs): 1,000 ppm
- Poly-brominated diphenyl ethers (PBDEs): 1,000 ppm
- Cadmium: 100 ppm
- Mercury: 1,000 ppm
- Lead: 1,000 ppm
- Bis(2-ethylhexyl) phthalate (DEHP): 1,000 ppm
- Butyl benzyl phthalate (BBP): 1,000 ppm
- Dibutyl phthalate (DBP): 1,000 ppm
- Diisobutyl phthalate (DIBP): 1,000 ppm

Important Safety Information

Environmental conditions:

- Do not store this product in an environment where the temperature is below -20 °C or above 80 °C.
- To prevent damage, operate the product only in a controlled environment.

Care for your IBASE products:

- Before cleaning the board, unplug all cables and remove the battery.
- Use only approved electronics-grade cleaners.
- Use a computer vacuum cleaner to remove dust and prevent fan blockage.

⚠ WARNING — Usage Precautions

- Do not use this product near water.
- Do not spill water or any liquids on this product.
- Do not place heavy objects on top of this product.

Anti-static precautions

- Wear an anti-static wrist strap to avoid electrostatic discharge.
- Place the board on an anti-static mat.
- Hold the board by its edges when handling.
- Touch a grounded metal surface or chassis ground instead of touching board components.
- Ground yourself frequently by touching a grounded conductor or metal surface.

⚠ CAUTION — Battery Replacement

There is a risk of explosion if the internal battery is replaced with an incorrect type. Replace only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions or local regulations.

Table of Contents

Chapter 1
General Information

The information provided in this chapter includes:

- Features
- Packing List
- Optional Accessories
- Specifications
- Block Diagram
- Board Pictures
- Board Dimensions

1.1 Introduction

The PI900F is a PICO-ITX motherboard powered by Intel® Core Ultra 100U Series mobile processors, delivering efficient performance for embedded applications. It supports up to 48GB of DDR5-5600 SO-DIMM memory and features dual display outputs with HDMI 2.0b and Type-C. The board offers rich connectivity, including PCIe 2.5G LAN port, One COM port (RS232/422/485), three USB 3.2 Type-A ports, two USB 2.0 ports. Expansion options include two M.2 sockets (M2280 for SATA/PCIe and E2230 for USB/PCIe), while reliability is enhanced with a watchdog timer, digital I/O, and fTPM support. With a +12 V DC power input and a compact 100 mm × 72 mm board size, the PI900F is well-suited for space-constrained industrial and IoT deployments requiring robust connectivity and security.

1.2 Features

- Onboard Intel® Core Ultra 100U Series mobile Processors
- 1x DDR5-5600 SO-DIMM, Max. 48GB
- Supports HDMI (2.0b)
- 1x RTL-8125BG PCIe 2.5G LAN, 1x COM (RS232/422/485)
- 3x USB 3.2 (Type-A), 2x USB 2.0
- 2x M.2 sockets (M2280 [SATA + PCI-E] + E2230 [USB + PCI-E])
- Watchdog timer, Digital I/O, TPM (2.0), +12V DC input only
- Board dimensions: 100mm x 72mm

PI900F with Heatsink

1.3 Packing List

Your PI900F package should include the items listed below. If any of the items below is missing, contact the distributor or dealer you purchased the product from.

- PI900F Motherboard x 1

1.4 Optional Accessories

IBASE provides the following optional accessories:

- PK1-195: Extension cable for COM port
- IDA103 : Single USB 2.0 port module
- EXT-920: Extension cable for IDA103 (USB 2.0 port)
- Heat sink (HSPI900F-C) (PN# H052HSPI900FC000CP)

1.5 Specifications

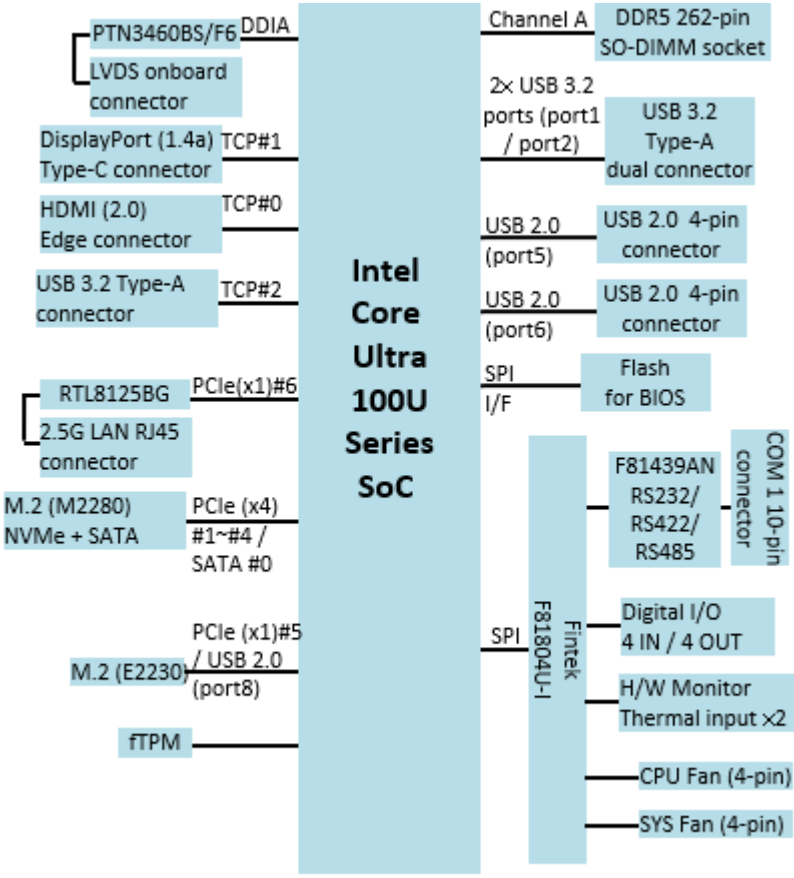
Model Name	Description
PI900F-125U	Intel® Core™ Ultra 100U Mobile Processors onboard PICO-ITX board, 1x 2.5Gb LAN, 1x HDMI, 1x COM, 2x M.2, 3x USB 3.2, 2x USB 2.0, 1x Type-C, LVDS (24-bit dual-channel)
PI900F-155U	Intel® Core™ Ultra 100U Mobile Processors onboard PICO-ITX board, 1x 2.5Gb LAN, 1x HDMI, 1x COM, 2x M.2, 3x USB 3.2, 2x USB 2.0, 1x Type-C, LVDS (24-bit dual-channel)

Specifications	
Dimensions	100mm x 72mm (3.94” x 2.84”)
CPU	Intel® Core™ Ultra 100U Mobile Processors (Meteor Lake – U)
Memory	1x DDR5-5600 MHz, Max. 48GB
Mini Type Slots	1x M.2 (M-Key, type:2280, supports SATA & PCI-E(x1) signal) 1x M.2 (E-Key, type: 2230, supports USB 2.0 & PCI-E(x1) signal)
Graphics	Intel® SoC integrated graphics
Video Output	1x HDMI (2.0b); 1x Type-C (DP Alt Mode 4K@60Hz); 1x LVDS (24-bit dual-channel)
Ethernet	1x Realtek RTL-8125BG PCI-E 2.5G LAN ports
BIOS	AMI BIOS
Super I/O	Fintek F81804U
Audio	Built-in audio w/ Realtek audio codec ALC888S-VD2-GR
Serial Port	1x RS232/422/485
USB 2.0	2x USB 2.0 (pin header)
USB 3.X	3x USB 3.1 Gen2 (10Gbps) 1x USB Type-C @ edge connector
Digital IO	4-In & 4-Out
TPM 2.0	Nuvoton NPCT760AABYX
Others	fTPM, 12V power input, H/W Monitor
Watchdog Timer	Yes (256 segments, 0, 1, 2…255 sec / min)

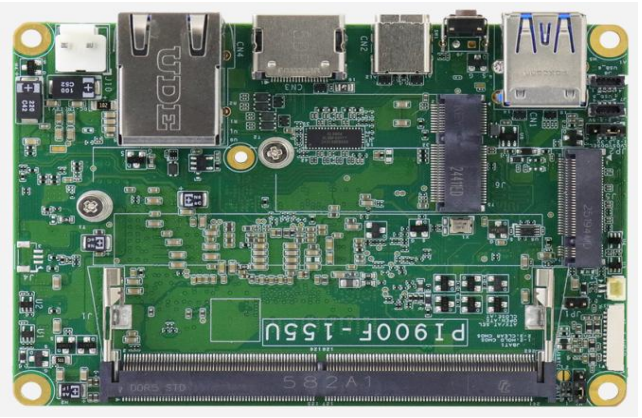
Environment	
Operating Temperature	0 ~ 60 °C (32 ~ 140 °F)
Storage Temperature	-20 ~ 80 °C (-4 ~ 176 °F)
Relative Humidity	90 % (non-condensing)

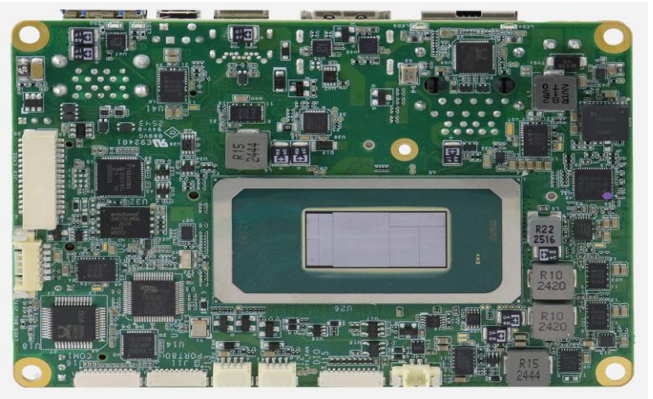
All specifications are subject to change without prior notice.

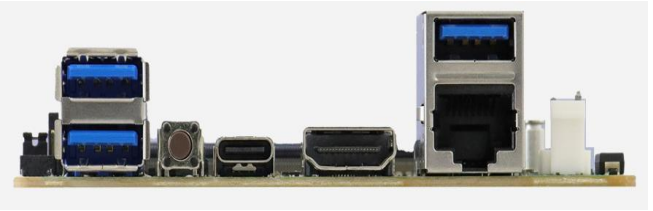
1.6 Block Diagram



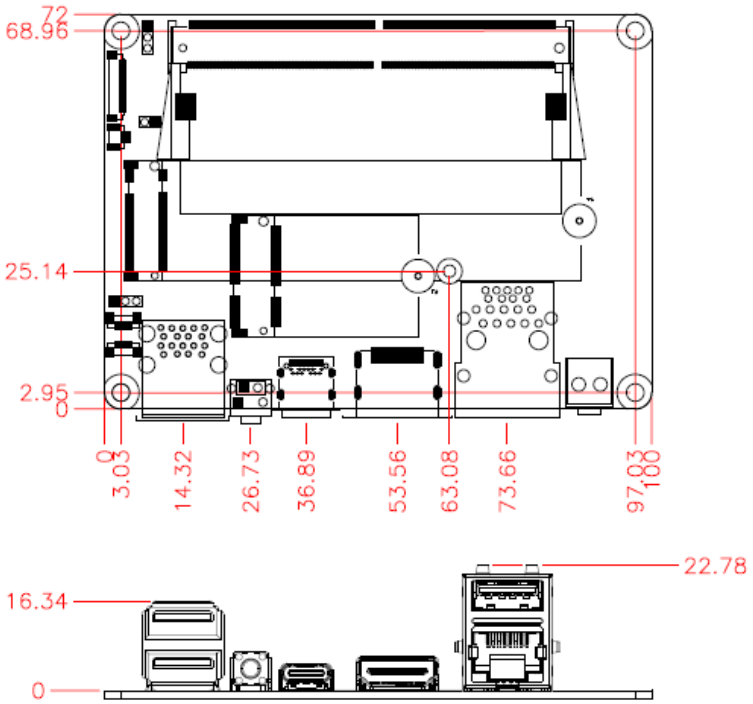
1.7 Board Pictures



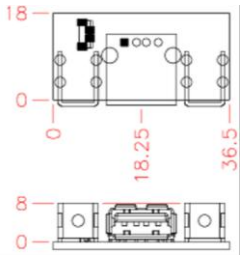




1.8 Dimensions



(PI900F Board)



(IDA103 USB 2.0 Module)

Chapter 2
Hardware Configuration

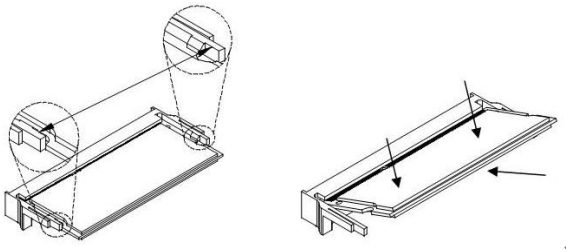
This section provides information on jumper settings and connectors on the PI900F in order to set up a workable system. The topics covered are:

- Essential installations
- Jumpers and Connectors

2.1 Essential Installations

2.1.1 Installing the Memory

The PI900F supports one DDR5 memory socket. To install the modules, locate the memory slot on the board and perform the following steps:



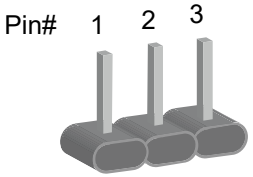
1. Align the key of the memory module with that on the memory slot and insert the module slantwise.
2. Gently push the module in an upright position until the clips of the slot close to hold the module in place when the module touches the bottom of the slot.

To remove the module, press the clips outwards with both hands, and the module will pop up.

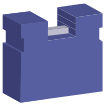
2.2 Setting the Jumpers

Set up and configure your PI900F by using jumpers for various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your use.

Jumpers are short-length conductors consisting of several metal pins with a non-conductive base mounted on the circuit board. Jumper caps are used to have the functions and features enabled or disabled. If a jumper has 3 pins, you can connect either PIN1 to PIN2 or PIN2 to PIN3 by shorting.

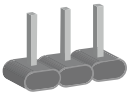
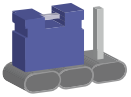
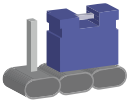
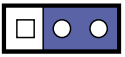


A 3-pin jumper



A jumper cap

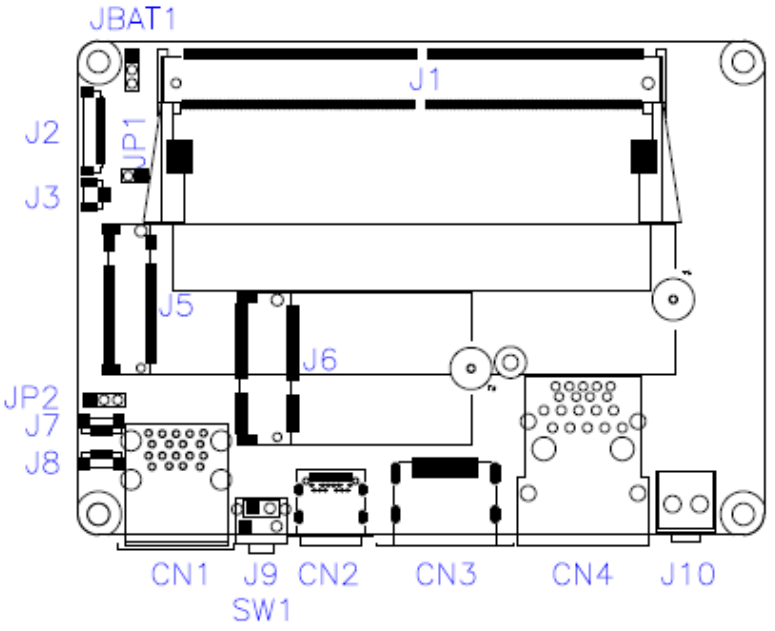
Refer to the illustration below to set jumpers.

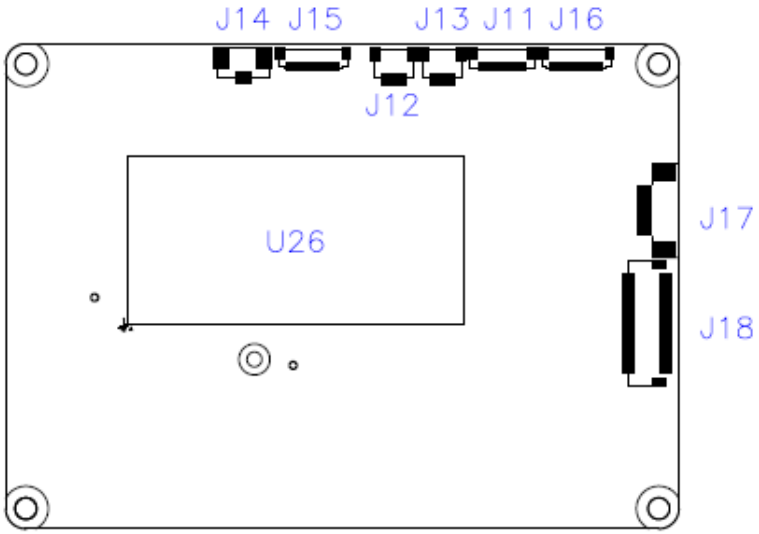
Pin closed	Jumper	Setting
Open		
1-2		
2-3		

When two pins of a jumper are encased in a jumper cap, this jumper is **closed**, i.e. turned **On**.

When a jumper cap is removed from two jumper pins, this jumper is **open**, i.e. turned **Off**.

2.3 Jumper & Connector Locations

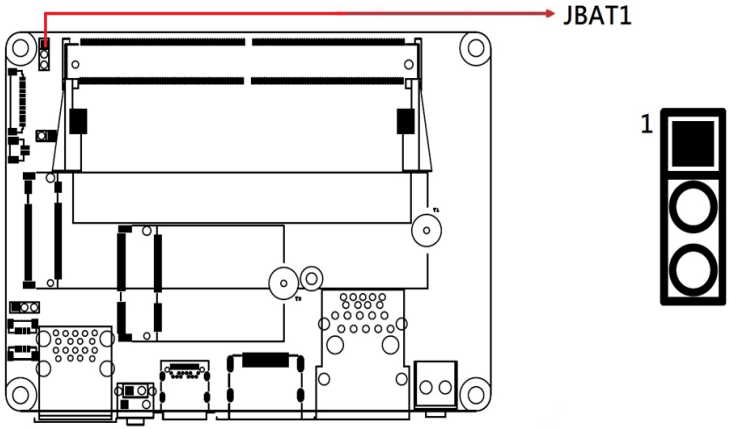



J14 J15
J13 J11 J16
J12
U26
J17
J18

2.4 Jumpers Quick Reference

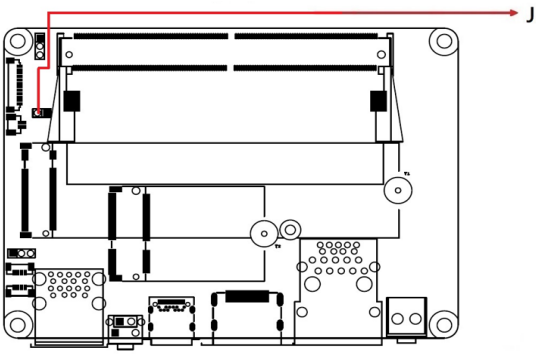
Function	Jumper
Clear CMOS Data	JBAT1
AT / ATX Selection	JP1
LVDS Panel Power Selection	JP2

2.4.1 Clear CMOS Contents (JBAT1)



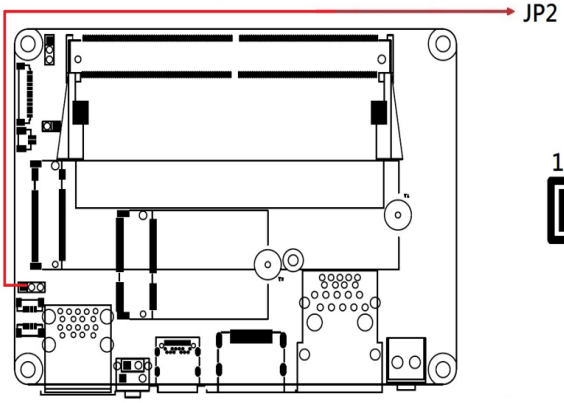
Function	Pin closed	Setting
Normal	1-2	1
Clear CMOS	2-3	1

2.4.2 ATX & AT Power Mode Selection (JP1)



Function	Pin closed	Setting
ATX	Open	1
AT	Close	1

2.4.3 LVDS Panel Power Selection (JP2)

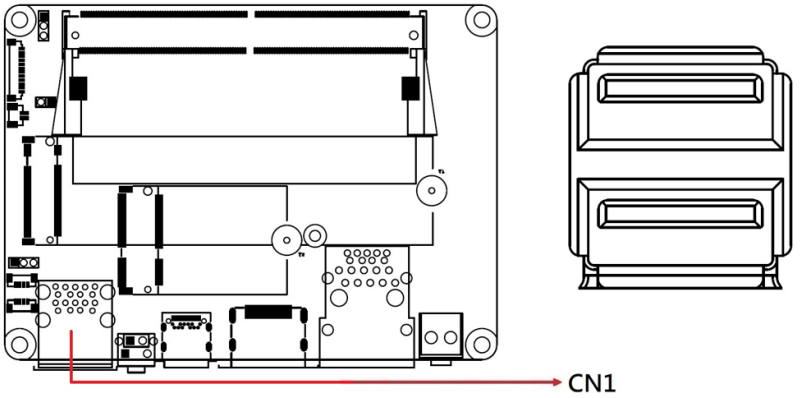


Function	Pin closed	Illustration
3.3V (default)	1-2	1
5V	2-3	1

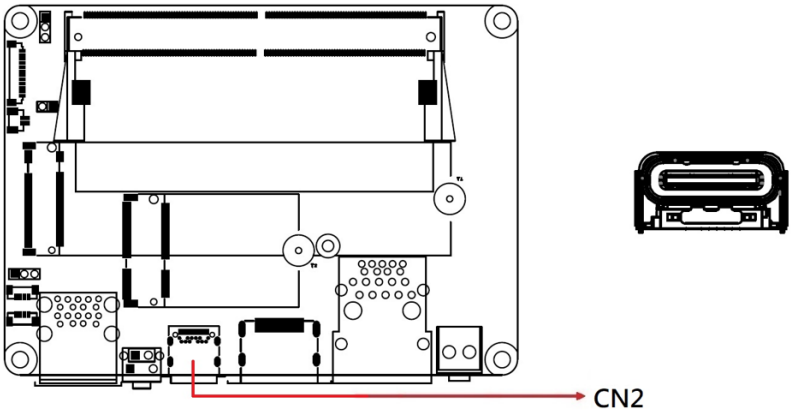
2.5 Connectors Quick Reference

Function	Connector
2x USB 3.2 Gen 2 Type-A	CN1
USB Type-C Connector	CN2
HDMI Connector	CN3
2.5G LAN (RTL8125BG) + Type-A USB3.2 Gen2	CN4
CPU Fan Power Connector	J13
SYS Fan Power Connector	J12
DDR5 SO-DIMM Socket	J1
Audio Connector	J2
12V Input Connector	J10
Power Switch	SW1 (J9)
System Reset	J3
M.2 M-Key Slot	J5
M.2 E-Key Slot	J6
Coin Battery Socket	J14
Serial Port	J16
Digital I/O 4in-4out	J15
USB 2.0 Header	J7, J8
LCD Backlight Connector	J17
LVDS Connector	J18
80 Port	J11

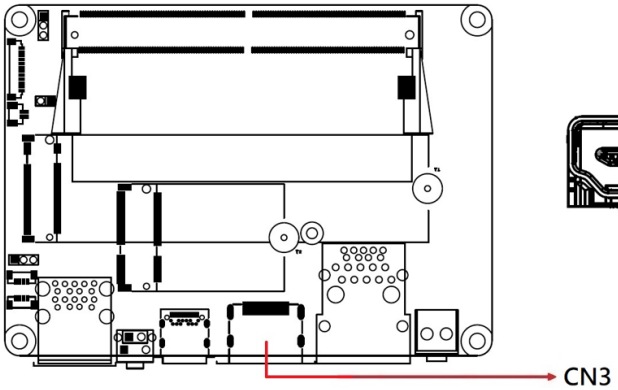
2.5.1 2x USB3.2 Gen 2 Type-A (CN1)



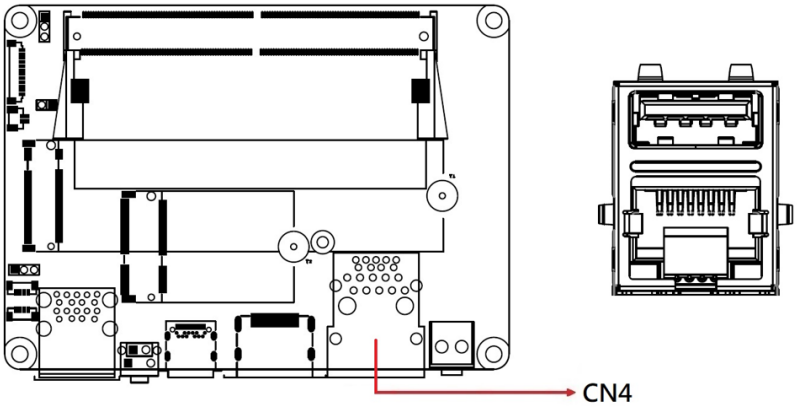
2.5.2 USB Type-C Connector (CN2)



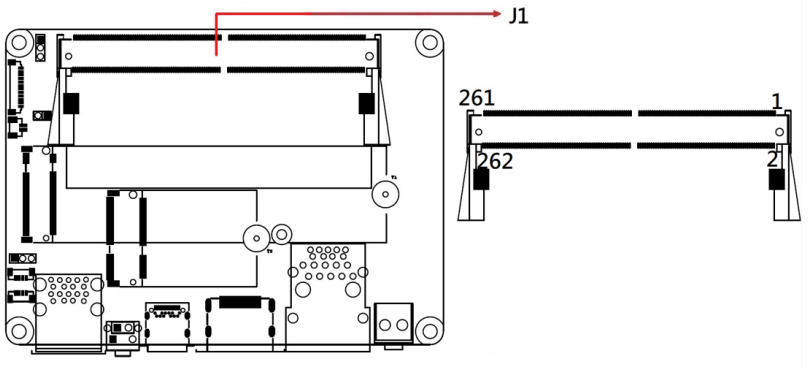
2.5.3 HDMI Connector (CN3)



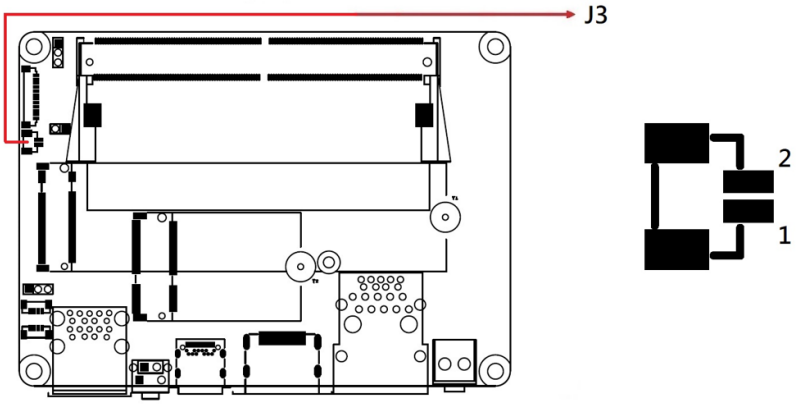
2.5.4 2.5G LAN (RTL8125BG) + Type-A USB3.2 Gen2 (CN4)



2.5.5 DDR5 SO-DIMM Socket (J1)

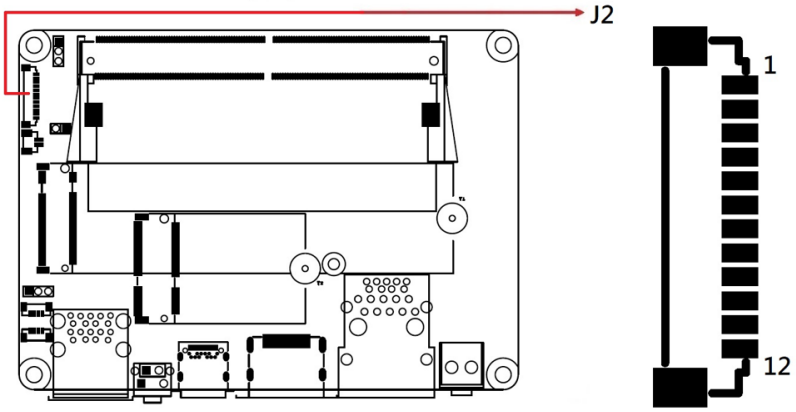


2.5.6 System Reset (J3)



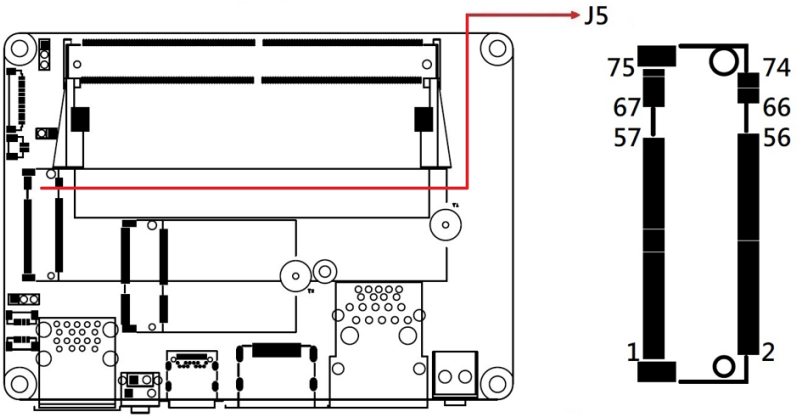
Pin	Assignment
1	Reset
2	Ground

2.5.7 Audio Connector (J2)

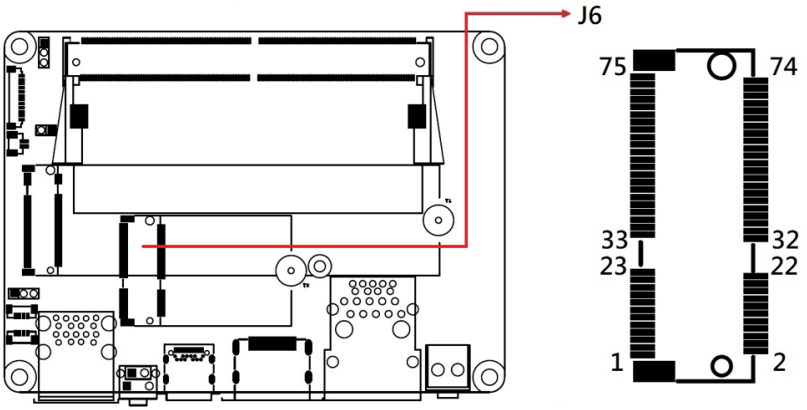


Pin	Assignment
1	GND
2	LINE_OUT_R
3	LINE_OUT_L
4	JD_FRONT
5	GND
6	LINE_IN_R
7	LINE_IN_L
8	JD_LINEIN
9	GND
10	MIC1_R
11	MIC1_L
12	JD_MIC1

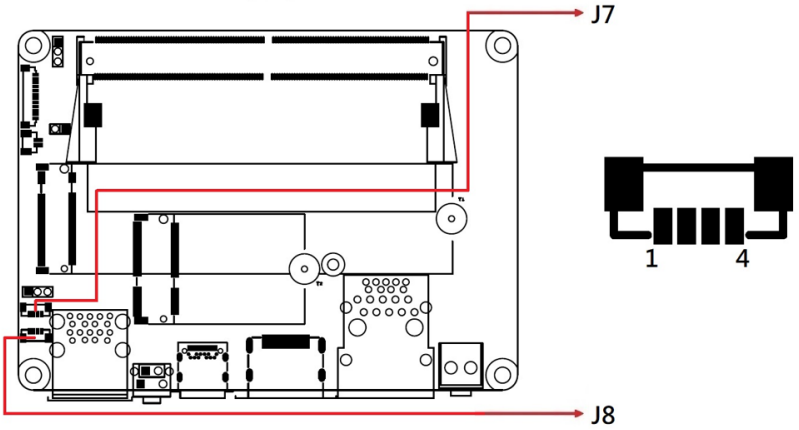
2.5.8 M.2 M-Key Slot (J5)



2.5.9 M.2 E-Key Slot (J6)

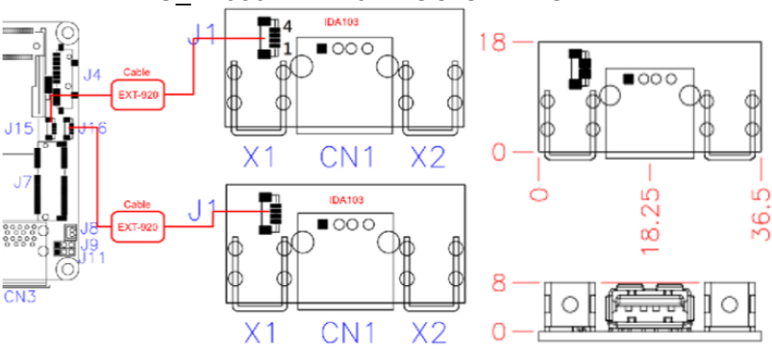


2.5.10 USB 2.0 Header (J7, J8)

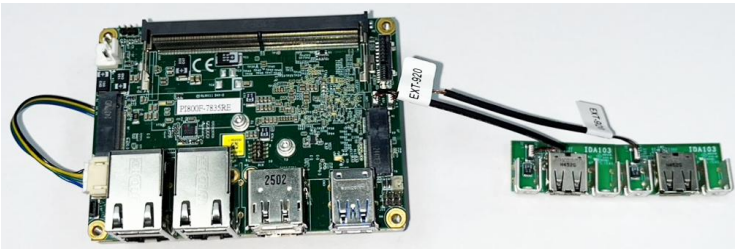


Pin	Assignment	Pin	Assignment
1	+5V	3	USB2P
2	USB2N	4	GND

Remarks: TYU_TF0801WNV-04S-GO-C1-NL-C-A

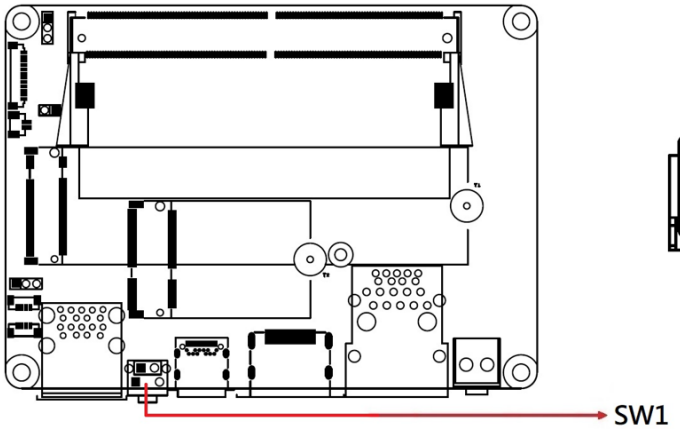


IDA103

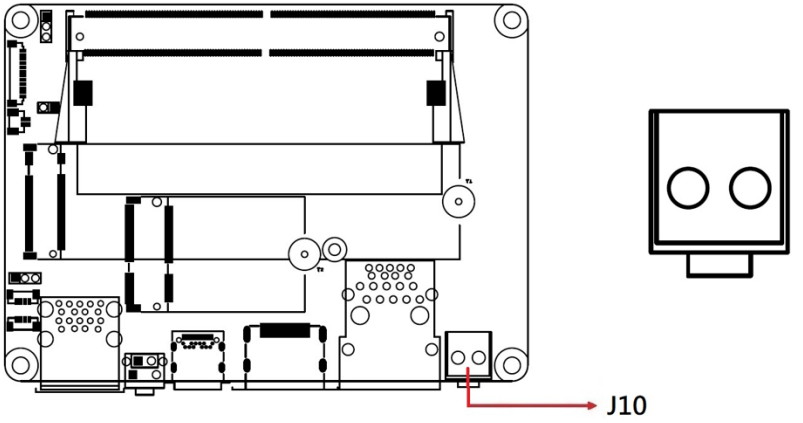


The picture shows EXT-920 cables connected to the J15/J16 headers and to the IDA103 USB 2.0 modules

2.5.11 Power Switch (SW1 / J9)

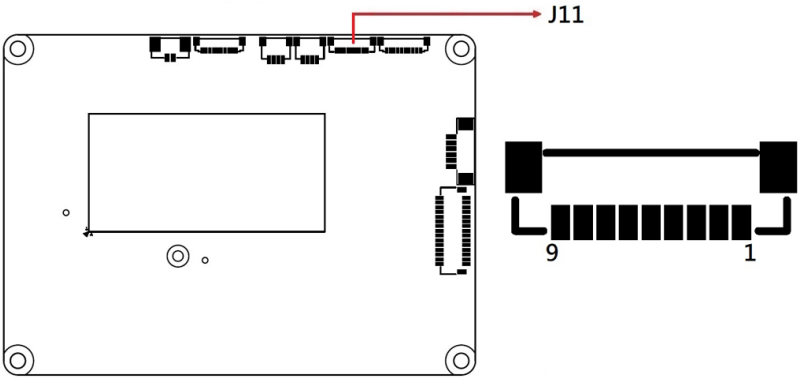


2.5.12 12V Input Connector (J10)



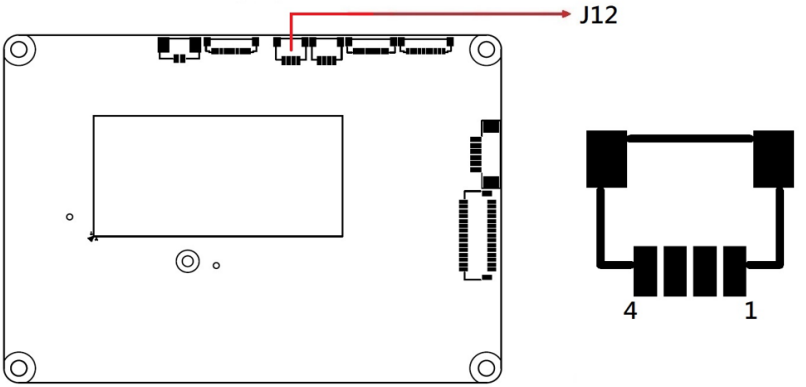
Pin	Assignment
1	+12V
2	Ground

2.5.13 80 Port (J11)



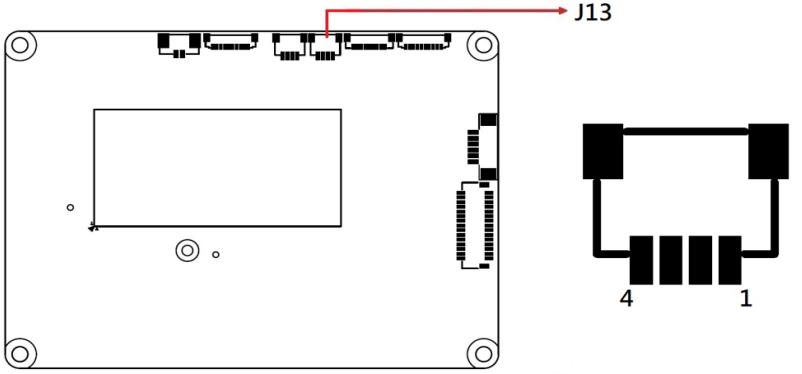
Pin	Assignment
1	1.8V
2	ESPI_RST#
3	ESPI_CS
4	GND
5	ESPI_IO_0
6	ESPI_IO_1
7	ESPI_IO_2
8	ESPI_IO_3
9	ESPI_CLK

2.5.14 System Fan Power Connector (J12)



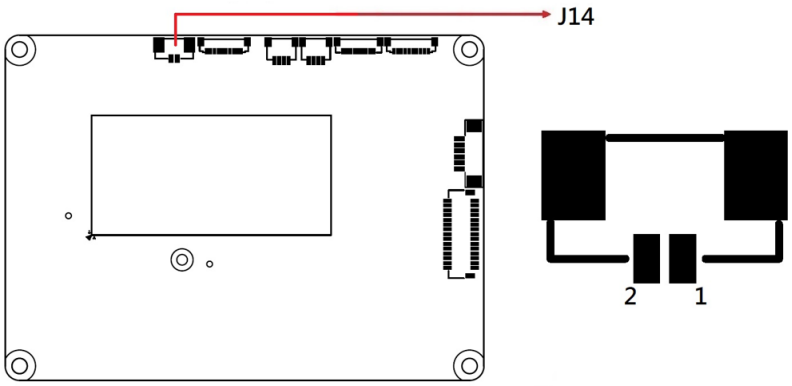
Pin	Assignment
1	GND
2	12V
3	Fan-In
4	Fan-Out

2.5.15 CPU Fan Power Connector (J13)



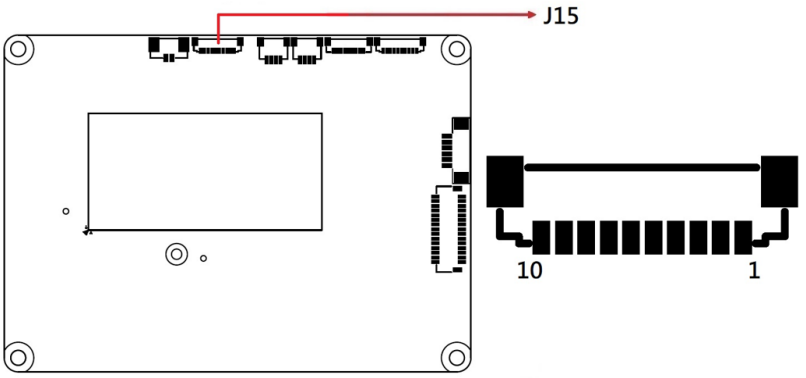
Pin	Assignment
1	GND
2	12V
3	Fan-In
4	Fan-Out

2.5.16 Coin Battery Socket (J14)



Pin	Assignment
1	3.3V
2	GND

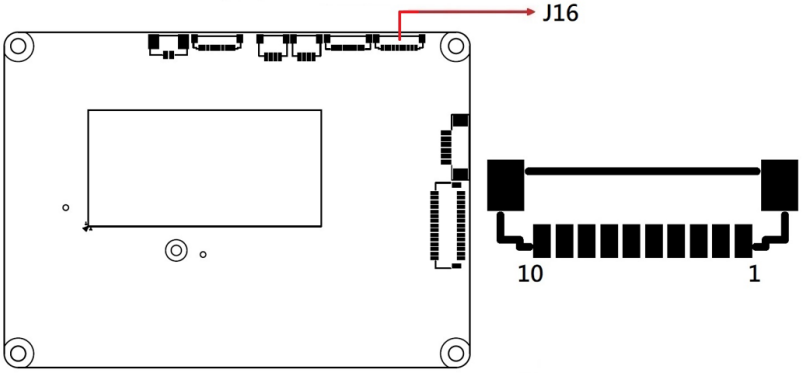
2.5.17 Digital I/O 4in-4out (J15)



Pin	Assignment
1	+5V
2	OUT0
3	OUT1
4	OUT2
5	OUT3
6	GND
7	IN0
8	IN1
9	IN2
10	IN3

Remarks: TECHBEST_AS0960110AC10

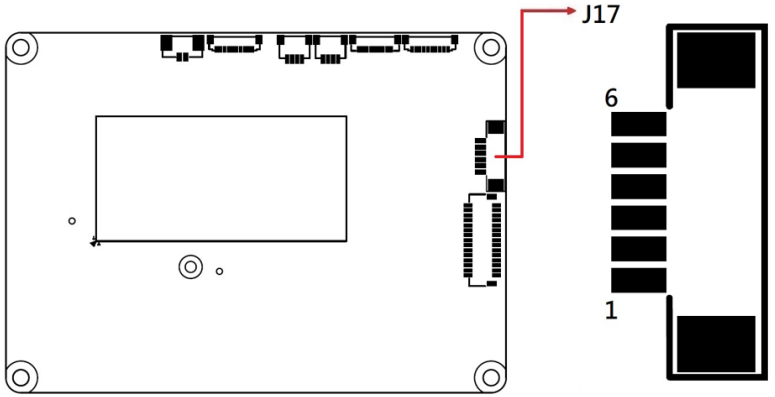
2.5.18 Serial Port (J16)



Pin	Assignment
1	DCD_1
2	SIN_1
3	SOUT_1
4	DTR_1
5	GND
6	DSR_1
7	RTS_1
8	CTS_1
9	RI_1
10	RI_1

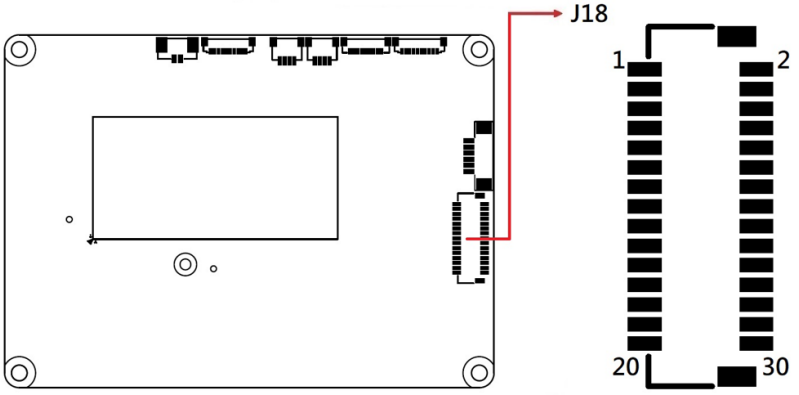
Remarks: TECHBEST_AS0960110AC10

2.5.19 LCD Backlight Connector (J17)



Pin	Assignment
1	+12V
2	+12V
3	GND
4	GND
5	Backlight Enable
6	Brightness Control

2.5.20 LVDS Connector (J18)



Pin	Assignment	Pin	Assignment
1	LVSDE_P	2	LVSDO_P
3	LVSDE_N	4	LVSDO_N
5	GND	6	GND
7	LVSCKE_P	8	LVSCKO_P
9	LVSCKE_N	10	LVSCKO_N
11	GND	12	GND
13	LVSCE_P	14	LVSCO_N
15	LVSCE_N	16	LVSCO_P
17	GND	18	GND
19	LVSBE_P	20	LVSBO_P
21	LVSBE_N	22	LVSBO_N
23	GND	24	GND
25	LVSAE_P	26	LVSAO_N
27	LVSAE_N	28	LVSAO_P
29	VDD	30	VDD

Chapter 3
Driver Installation

This chapter introduces installation of the following drivers:

- Intel® Chipset Software Installation Utility
- HD Graphics Drivers
- Audio Drivers
- LAN Drivers
- Intel® ME Drivers
- Intel® Serial IO Drivers
- Intel® PMT Drivers
- Intel® NPU IO Drivers

3.1 Introduction

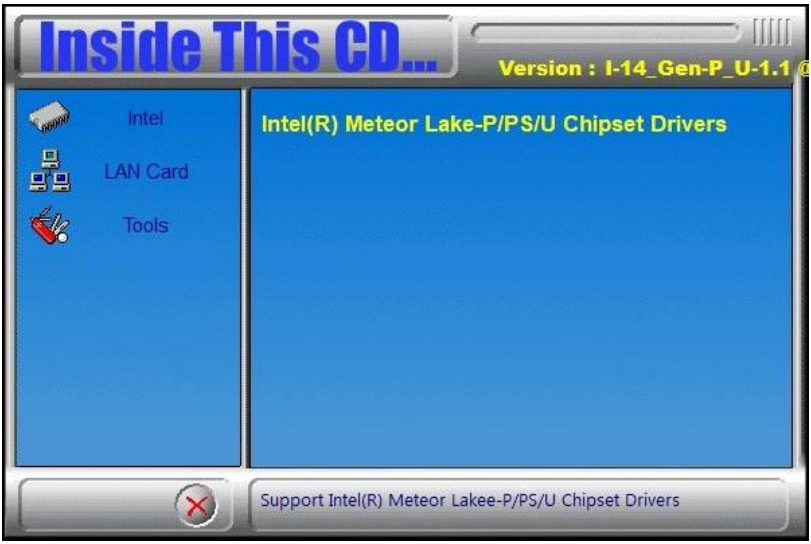
This section describes the installation procedures for software and drivers, under Windows 11, that can be downloaded from the IBASE website. The software drivers are available on the IBASE website. Go to the product's download page. Copy the compressed drivers file to your computer. Double-click the file to extract it. Run "CDGuide" to access the main drivers page.

Note: After installing your Windows operating system, you must install the Intel® Chipset Software Installation Utility first before proceeding with the drivers installation.

3.2 Intel® Chipset Software Installation Utility

The Intel® Chipset drivers should be installed first before the software drivers to install INF files for Plug & Play function for the chipset components. Follow the steps below.

1. Visit the IBASE download page and navigate to your product's support section. Download the compressed driver package and copy it to your system. Double-click the file to extract its contents. Run the CDGuide to open the main driver interface. In the left navigation pane, click Intel, then select Intel® Meteor Lake-P/PS/U Chipset Drivers.



3. Click Intel(R) Chipset Software Installation Utility.

4. When the *Welcome* screen to the Intel® Chipset Device Software appears, click **Next** to continue.

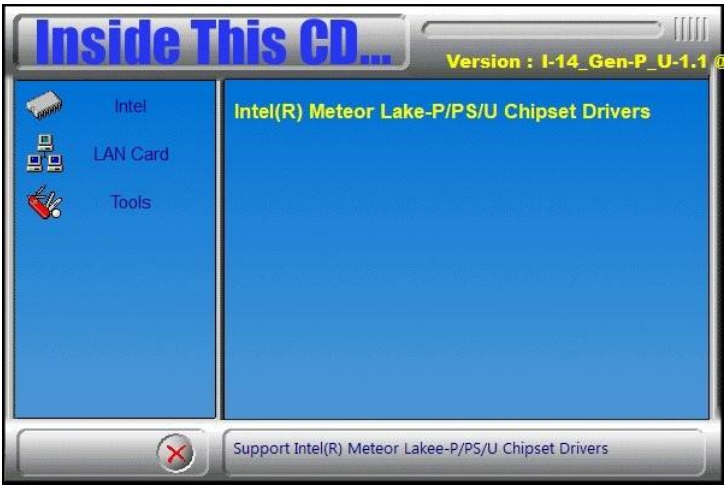
5. Accept the software license agreement.

6. On the *Readme File Information* screen, click **Install**.

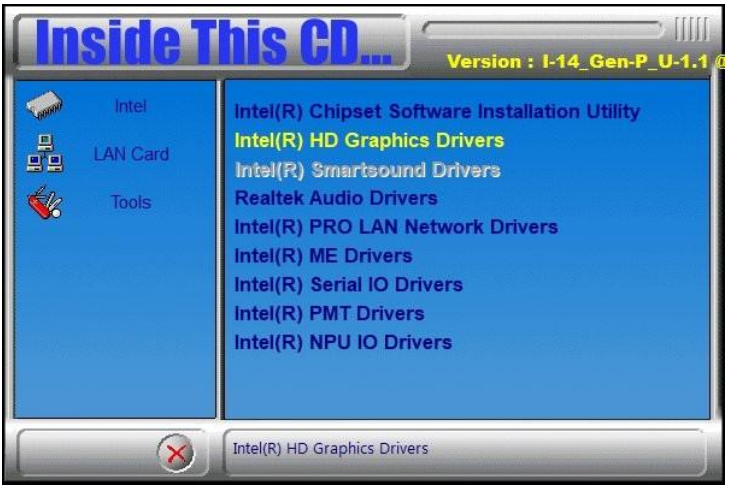
7. After completing the installation, click **Finish** to complete the setup process.

3.3 HD Graphics Drivers Installation

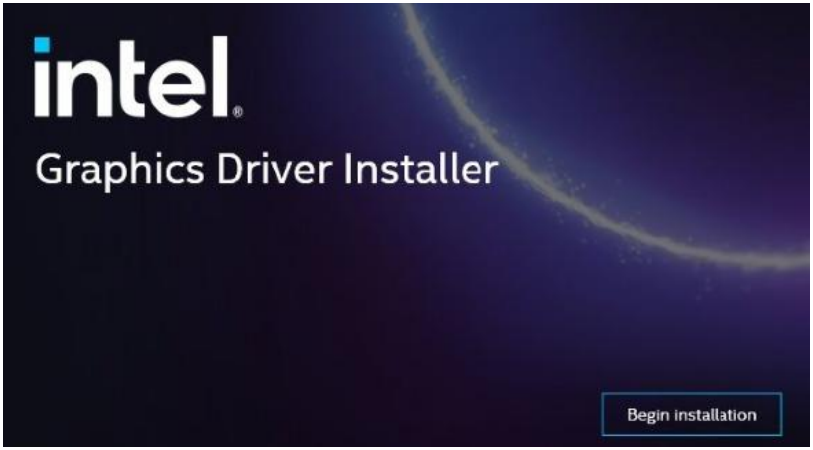
1. Click **Intel** on the left pane and then **Intel(R) Meteor Lake-P/PS/U Chipset Drivers** on the right pane.



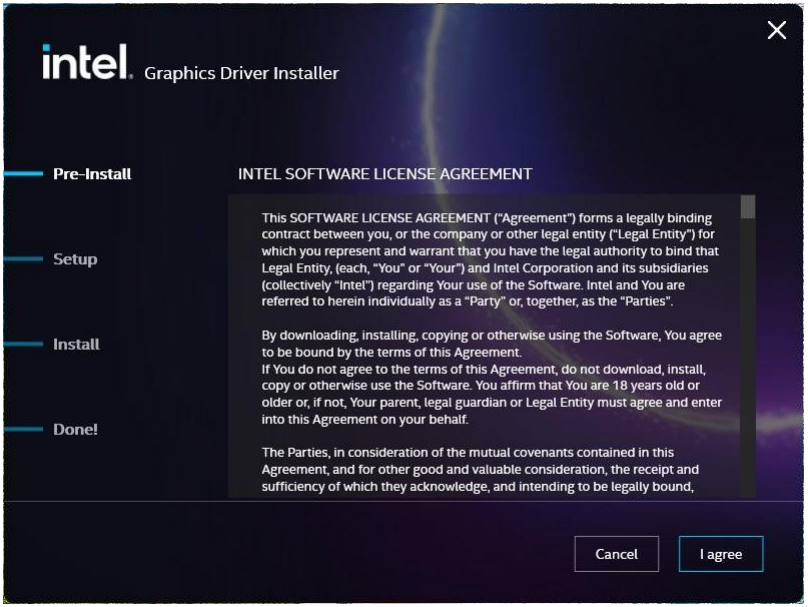
2. Click Intel(R) HD Graphics Driver.



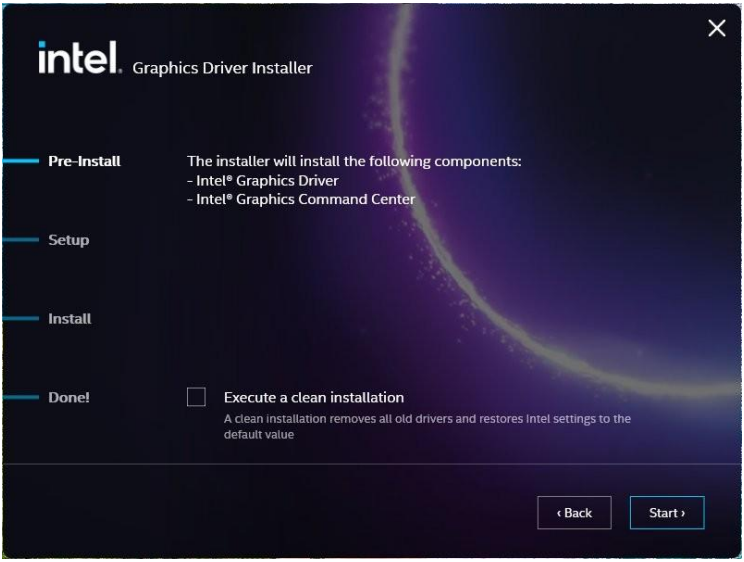
3. Click **Begin installation**.



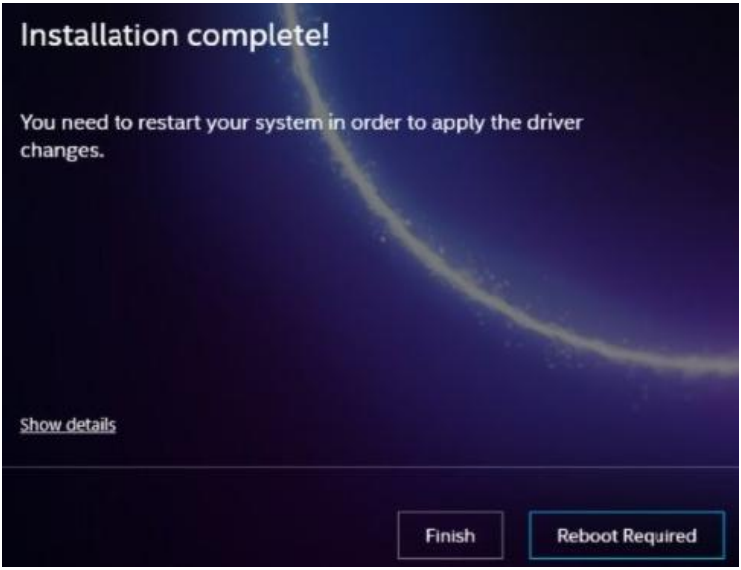
4. Click **I agree** in the INTEL SOFTWARE LICENSE AGREEMENT screen.



5. Click **Start** to install the graphics driver.



6. When installation has been completed, click **Finish**.

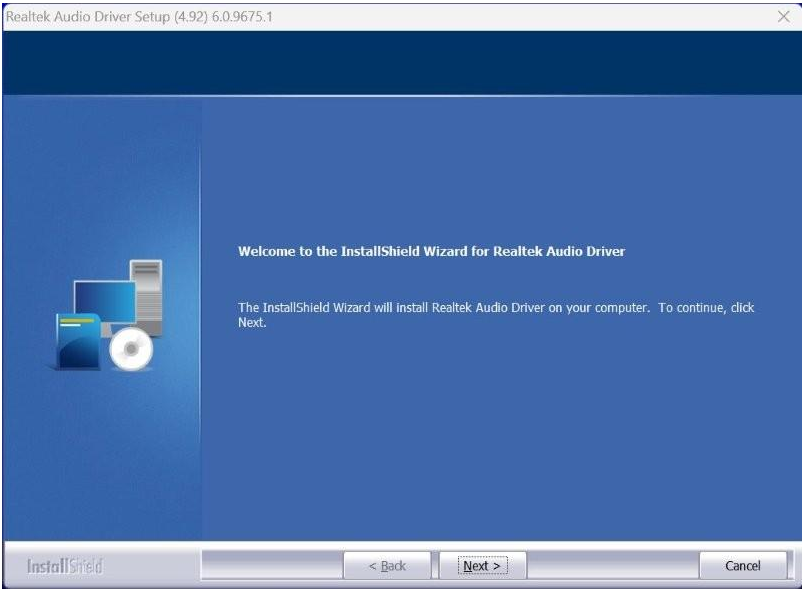


3.4 HD Audio Driver Installation

1. Click **Intel** on the left pane and then **Intel(R) Meteor Lake-P/PS/U Chipset Drivers** on the right pane, then click **Realtek Audio Drivers**.

2. On the next screen choose **Realtek Audio DCH Drivers**.

3. Click **Next** on the Welcome screen and the InstallShield Wizard will install Realtek Audio Driver on your system.

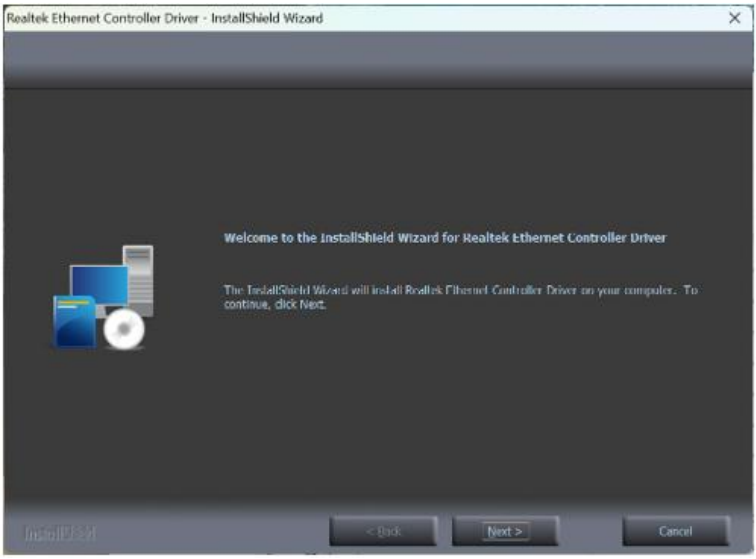


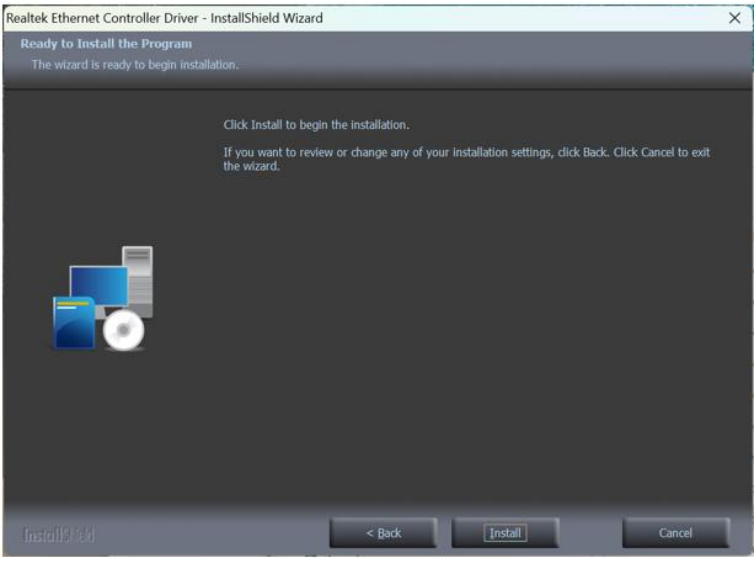
4. After the driver has been successfully installed, click **Finish** to restart the system.

3.5 LAN Driver Installation

1. To install the Realtek RTL8125BG driver, Click **LAN Card** on the left pane, then select **Realtek LAN Controller Drivers** on the right pane, then select **Realtek RTL8125BG 2.5 LAN Drivers**.

2. When the **Welcome** screen to the InstallShield Wizard appears, click **Next**. When the next screen, **Ready to Install the Program**, appears click **Install** to begin the installation.



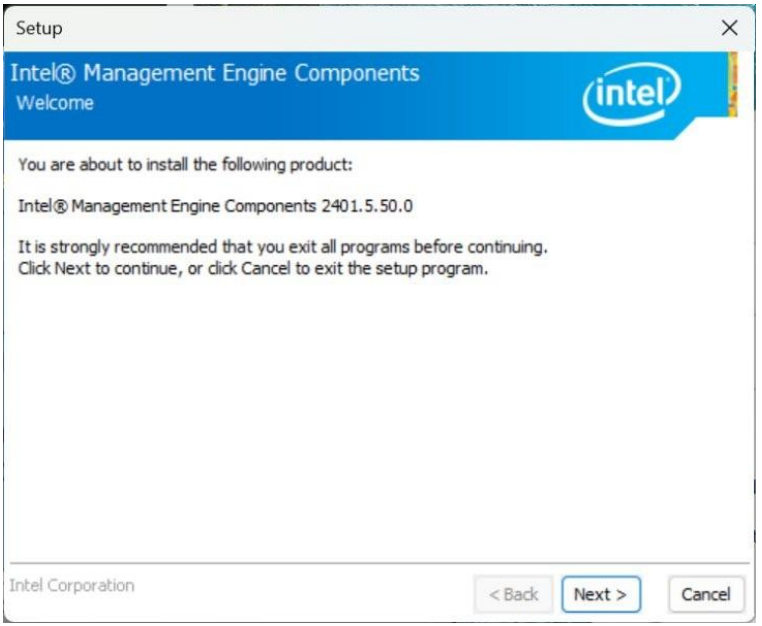


3. The next screen will show installation has been completed. Click **Finish** to exit the wizard.

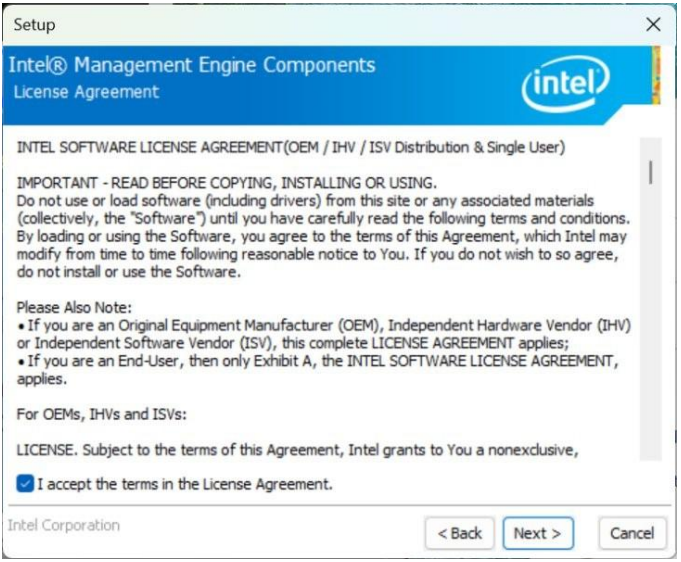
3.6 Intel® ME Drivers Installation

1. Click Intel on the left pane and then Intel(R) Meteor Lake-P/PS/U **Chipset Drivers** on the right pane, then click **Intel(R) ME Drivers**.

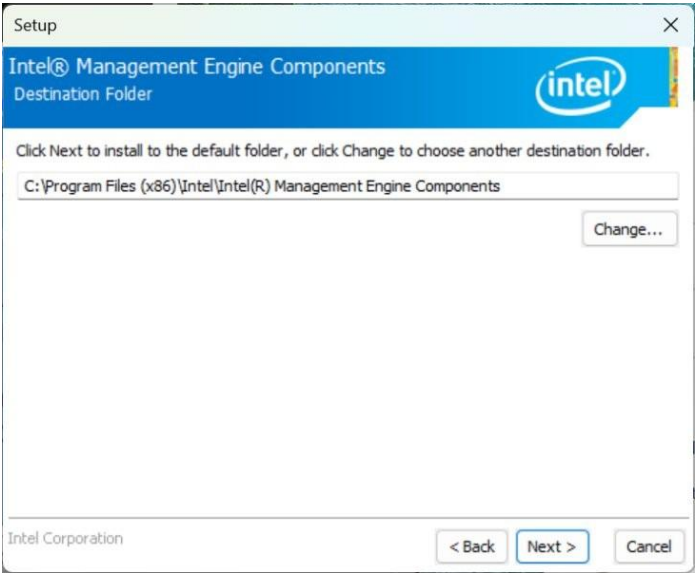
2. Click **Next** on the Welcome screen.



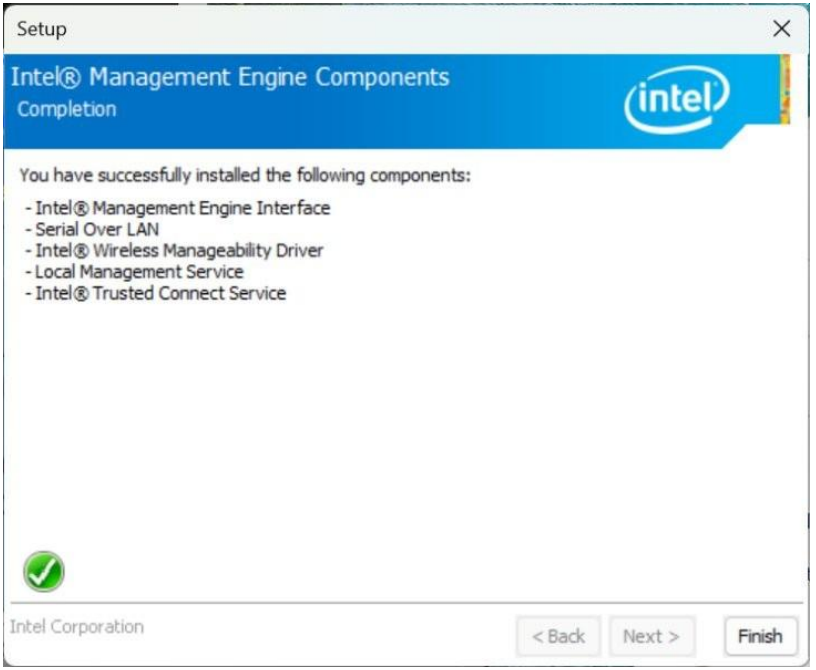
3. Accept the terms in the License Agreement.



4. Click **Next** to install to the default folder, or click **Change** to choose another destination folder.



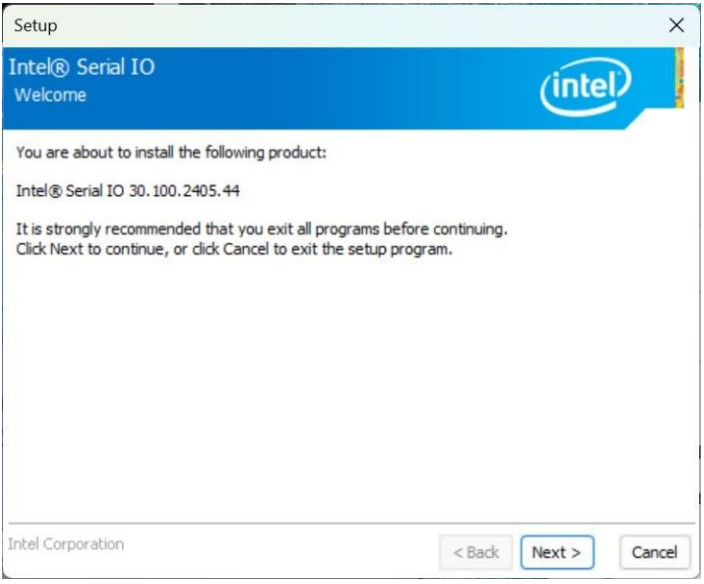
5. Click **Finish** after the ME components have been installed.



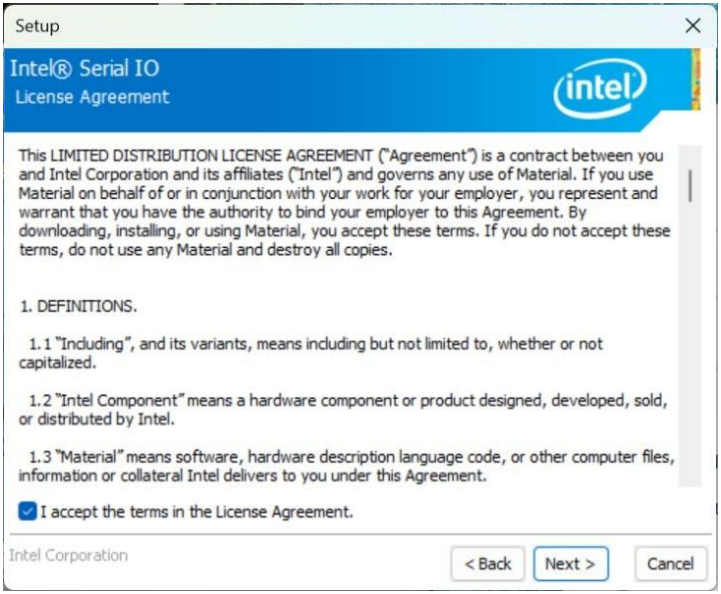
3.7 Intel® Serial IO Drivers Installation

1. Click Intel on the left pane and then Intel(R) Meteor Lake-P/PS/U **Chipset Drivers** on the right pane, then click **Intel(R) Serial IO Drivers**.

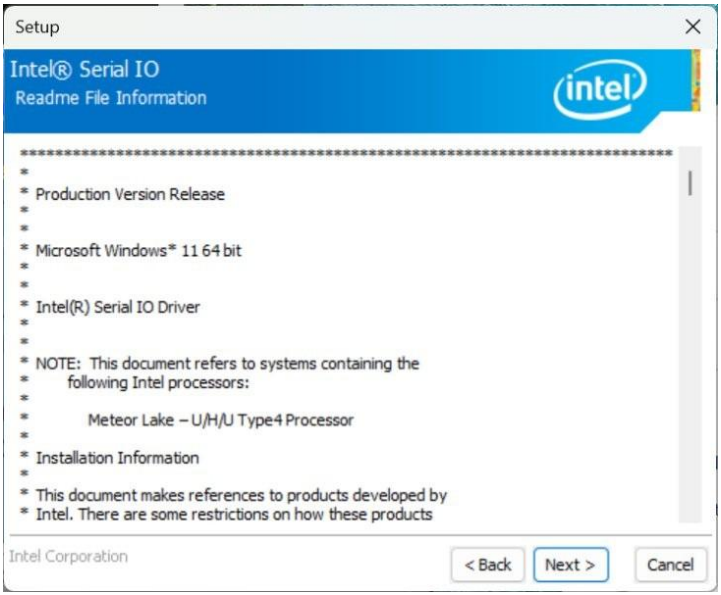
2. Click **Next** on the Welcome screen.

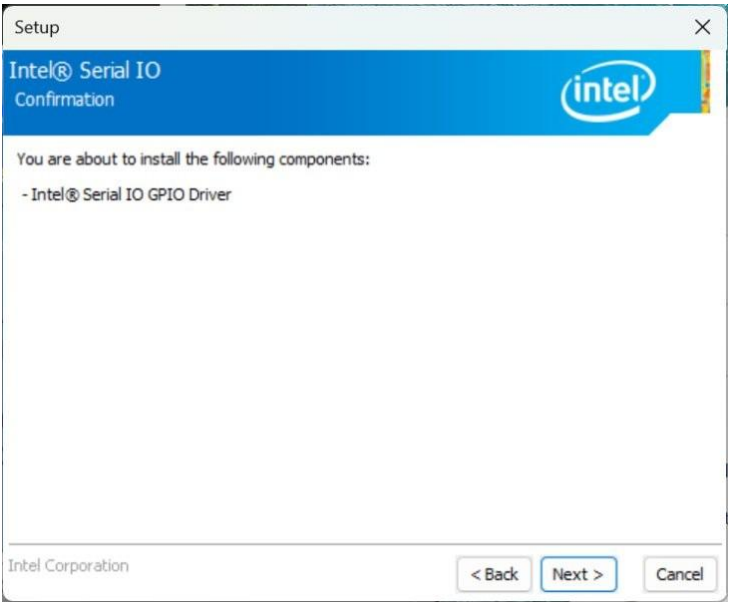


3. Accept the terms in the License Agreement.

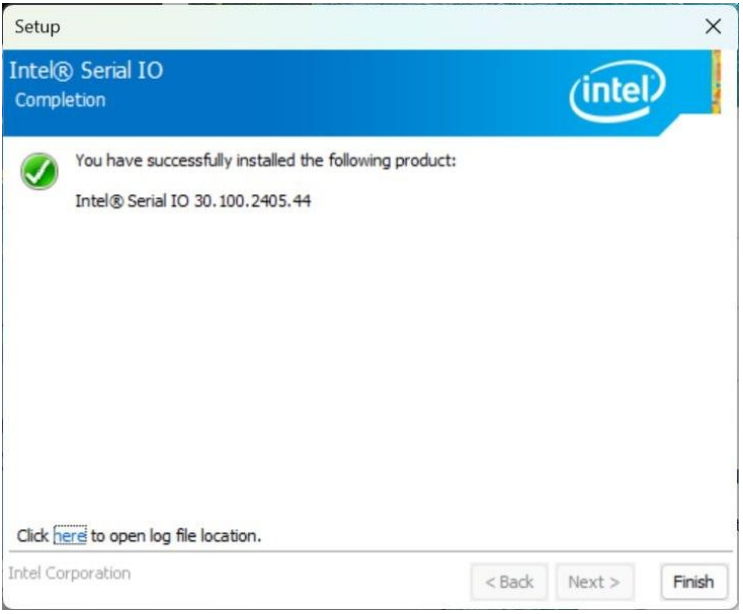


4. Click Next in both the Readme File Information and Confirmation screens.



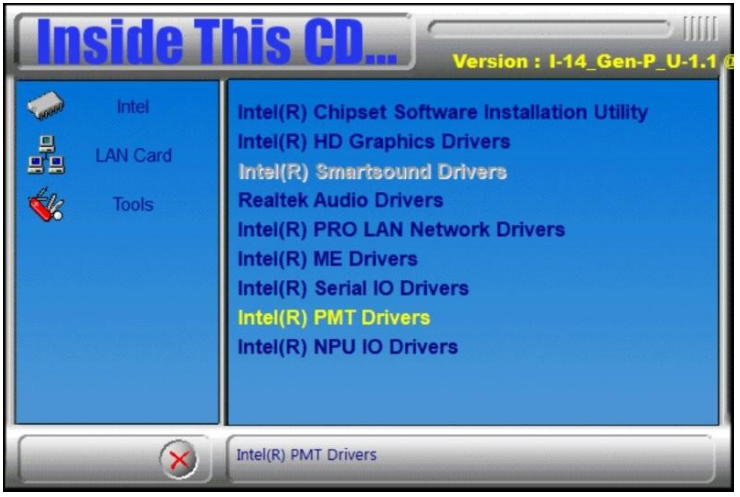


5. Click **Finish** after the Serial IO components have been installed.



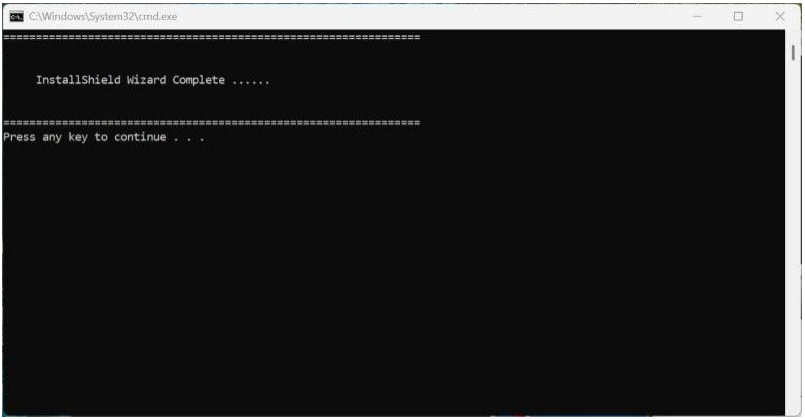
3.8 Intel® PMT Drivers Installation

1. Click Intel on the left pane and then Intel(R) Meteor Lake-P/PS/U **Chipset Drivers** on the right pane, then click **Intel(R) PMT Drivers**.



2. Follow the installation steps.

3. When InstallShield wizard has completed installation, press any key to continue.

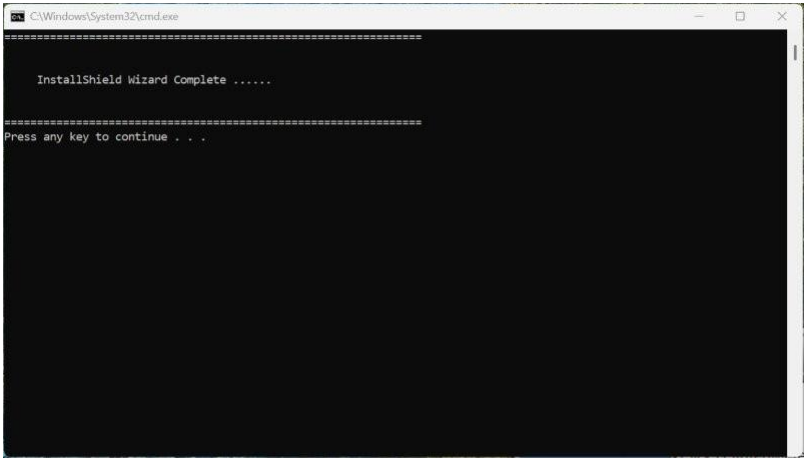


3.9 Intel® NPU IO Drivers Installation

1. Click Intel on the left pane and then Intel(R) Meteor Lake-P/PS/U **Chipset Drivers** on the right pane, then click **Intel(R) NPU IO Drivers**.

2. Follow the installation steps.

3. When InstallShield wizard has completed installation, press any key to continue.



Chapter 4
BIOS Setup

This chapter describes the different settings available in the AMI BIOS that comes with the board. The topics covered in this chapter are as follows:

- Main Settings
- Advanced Settings
- Chipset Settings
- Security Settings
- Boot Settings
- Save & Exit
- MEBx

4.1 Introduction

The BIOS (Basic Input/Output System) installed in the ROM of your computer system supports Intel® processors. The BIOS provides critical low-level support for standard devices such as disk drives, and serial ports. It also provides password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

4.2 BIOS Setup

The BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup.

If you still need to enter Setup, restart the system by pressing the ”Reset” button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again.

The following message will appear on the screen:

```
Press  <DEL>  to  Enter  Setup
```

In general, press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help, and <Esc> to quit.

When you enter the BIOS Setup utility, the *Main Menu* screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

Warning: It is strongly recommended that you avoid making any changes to the chipset defaults.

These defaults have been carefully chosen by both AMI and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could make the system unstable and crash in some cases.

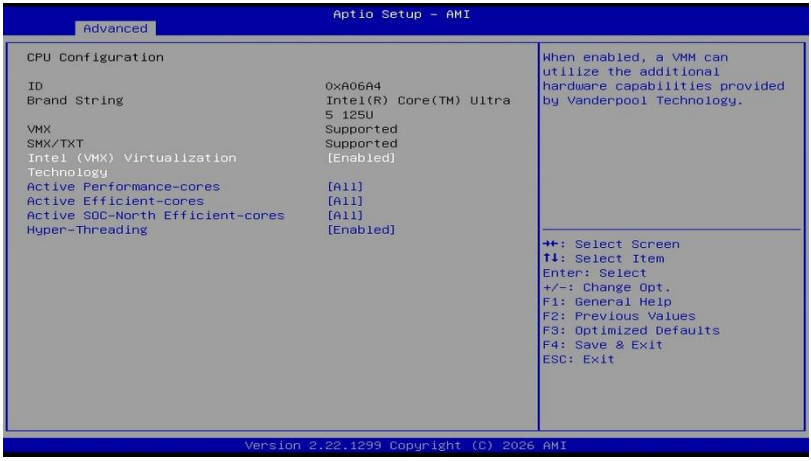
4.3 Main Settings

BIOS Setting	Description
System Date	Sets the date. Use the <Tab> key to switch between the Date elements.
System Time	Set the time. Use the <Tab> key to switch between the Time elements.

4.4 Advanced Settings

This section allows you to configure system features according to your preference.

4.4.1 CPU Configuration



BIOS Setting	Description
Intel (VMX) Virtualization Technology	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Active Performance-cores	Number of P-cores to enable in each processor package. Note: Number of cores and E-cores are looked at together. When both are (0,0), Pcode will enable all cores.
Active Efficient-cores	Number of E-cores to enable in each processor package. Note: Number of cores and E-cores are looked at together. When both are (0,0), Pcode will enable all cores.
Active SOC-North Efficient-cores	Selects how many SoC-North Efficient-cores are enabled in the processor package. When disabled, fewer E-cores are available for low-power/background processing.
Hyper-Threading	Options: Enabled or Disabled

4.4.2 Power & Performance

BIOS Setting	Description
Intel (R) Speedstep(tm)	Allows more than two frequency ranges to be supported
Intel(R) Speed Shift Technology	Enable/Disable Intel Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states.
Turbo Mode	Enable/disable processor turbo mode (requires EMTTM enabled too. AUTO means enabled.

4.4.3 PCH-IO Configuration

BIOS Setting	Description
SATA Configuration	SATA Device Options Settings.
SATA Controller(s)	Enable/Disable SATA Device.
SATA Mode Selection	Determines how SATA controller(s) operate.
Port 0	Enable or Disable SATA Port.
Hot Plug	Designates this port as Hot Pluggable.
Power Failure	Options: Always On, Always Off

4.4.4 PCH-FW Configuration

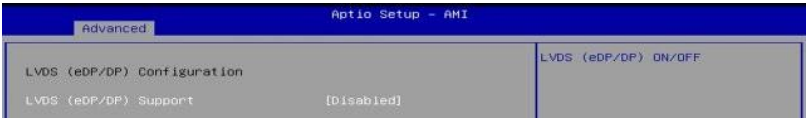
4.4.5 Trusted Computing

BIOS Setting	Description
Security Device Support	Enables / Disables BIOS support for security device. OS will not show security device. TCG EFI protocol and INT1A interface will not be available.
SHA256/384, SM3_256 PCR Bank	Enables / Disables PCR Bank.
Pending operation	Schedule an operation for the security device. Note: Your computer will reboot during restart in order to change state of security device.
Platform Hierarchy	Enables / Disables platform hierarchy.
Storage Hierarchy	Enables / Disables storage hierarchy.
Endorsement Hierarchy	Enables / Disables endorsement hierarchy.
Physical Presence Spec Version	Select to tell O.S. to support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3.
Device Select	TPM 1.2 will restrict support to TPM 1.2 devices. TPM 2.0 will restrict support to TPM 2.0 devices. Auto will support both with the default set to TPM 2.0 devices if not found, TPM 1.2 devices will be enumerated.

4.4.6 ACPI Settings

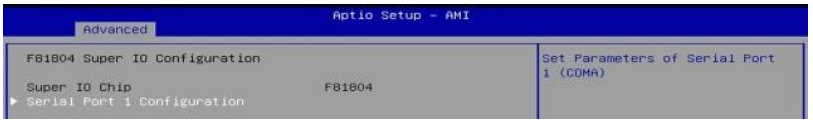
BIOS Setting	Description
Enable Hibernation	Enables / Disables the system ability to hibernate (OS/S4 Sleep State). This option may be not effective with some OS.

4.4.7 LVDS (eDP/DP) Configuration



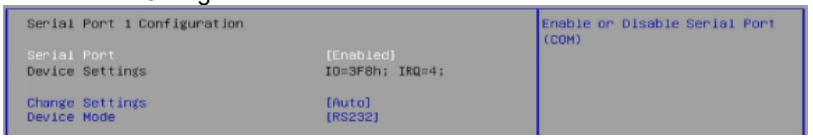
BIOS Setting	Description
LVDS (eDP/DP) Support	*LVDS (eDP/DP) ON/OFF*
Panel Color Depth	Selects the panel color depth. Options: 18 bit, 24bit (VESA/JEIDA)
LVDS Channel Type	Chooses the LVDS as single or dual channel.
Panel Type	Panel Type (Resolution) Options: 800 x 480, 800 x 600, 1024 x 768, 1280 x 768, 1280 x 800, 1280 x 960, 1280 x 1024, 1366 x 768, 1440 x 900, 1600 x 900, 1600 x 1200, 1680 x 1050, 1920 x 1080, 1920 x 1200

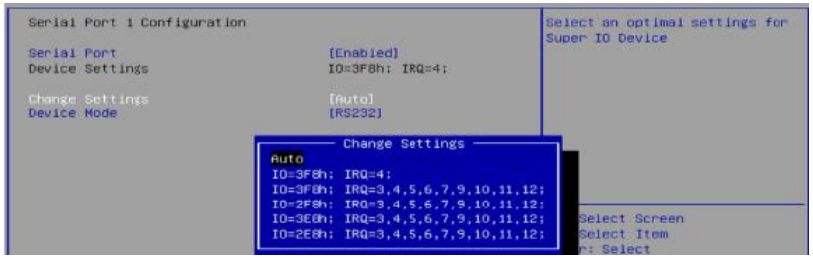
4.4.8 F81804 Super IO Configuration



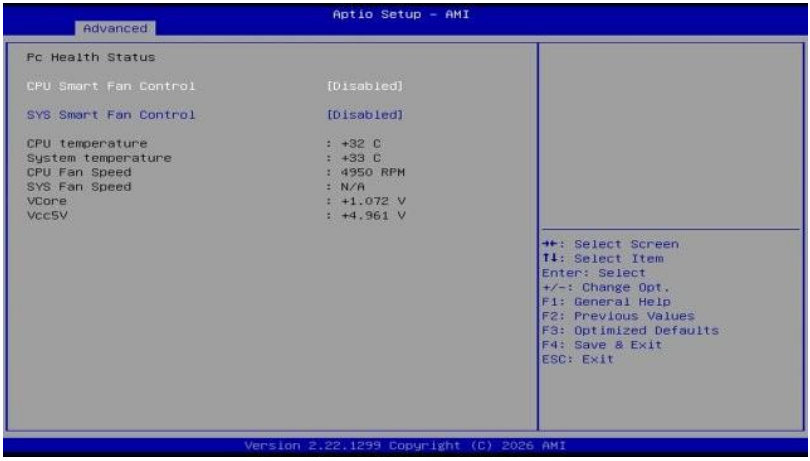
BIOS Setting	Description
Serial Ports Configuration	Sets parameters of serial ports. Enables / Disables the serial port and select an optimal setting for the Super IO device.

Serial Port 1 Configuration





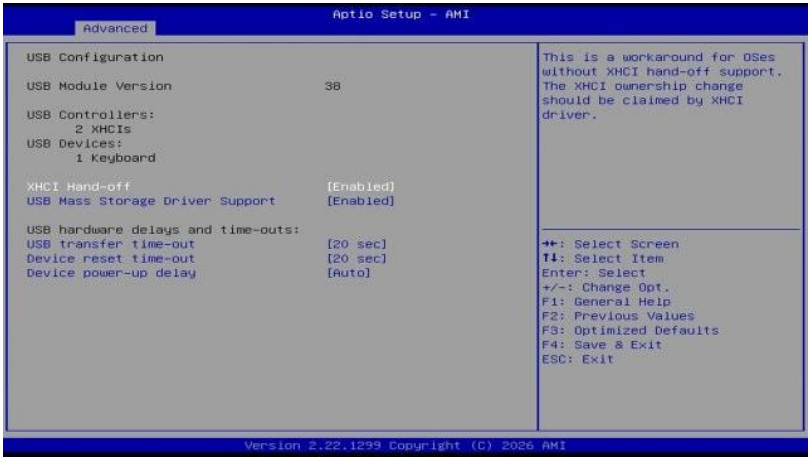
4.4.9 F81804 Hardware Monitor



BIOS Setting	Description
CPU/SYS Smart Fan Control	Enables / Disables smart fan control.
Temperatures / Voltages	These fields are the parameters of the hardware monitoring function feature of the motherboard. The values are read-only values as monitored by the system and show the PC health status.

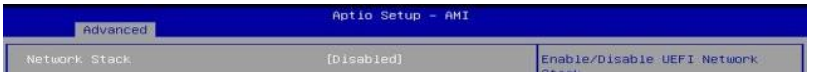
4.4.10 Intel TXT Information

4.4.11 USB Configuration



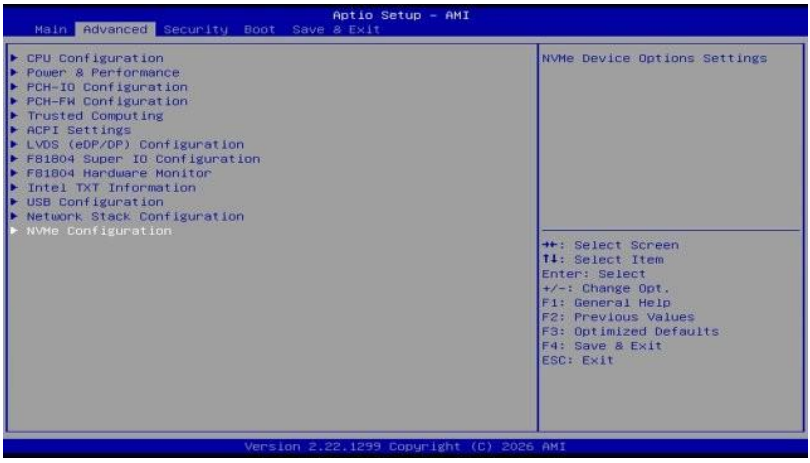
BIOS Setting	Description
XHCI Hand-off	This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
USB Mass Storage Driver Support	Enables / Disables the support for USB mass storage driver.
USB Transfer time-out	The time-out value (1 / 5 10 / 20 secs) for Control, Bulk, and Interrupt transfers.
Device reset time-out	Gives seconds (10 / 20 / 30 / 40 secs) to delay execution of Start Unit command to USB mass storage device.
Device power-up delay	Max.time the device will take before it properly reports itself to the Host Controller. '**Auto**' uses default value: for a Root port it is 100ms, for a Hub port the delay is taken from Hub descriptor.

4.4.12 Network Stack Configuration



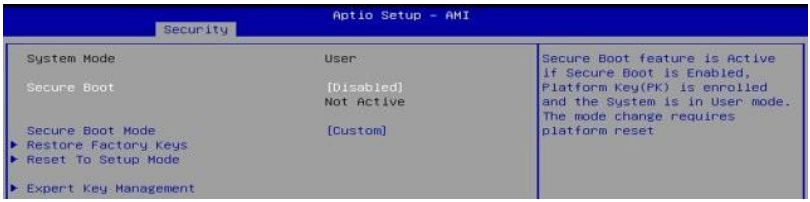
BIOS Setting	Description
Network Stack	Enable/Disable UEFI Network Stack
IPv4 PXE Support	If disabled, IPv4 PXE boot support will not be available.
IPv4 HTTP/S Support	If disabled, IPv4 HTTP boot support will not be available.
Ipv6 PXE Support	If disabled, IPv6 PXE boot support will not be available.
Ipv6 HTTP/S Support	If disabled, IPv6 HTTP boot support will not be available.
PXE boot wait time	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	Number of times the presence of media will be checked. Use either +/- numeric keys to set the value.

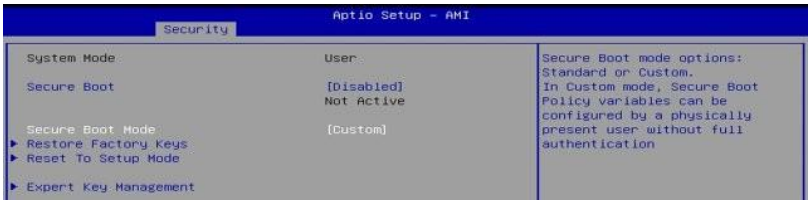
4.4.13 NVMe Configuration



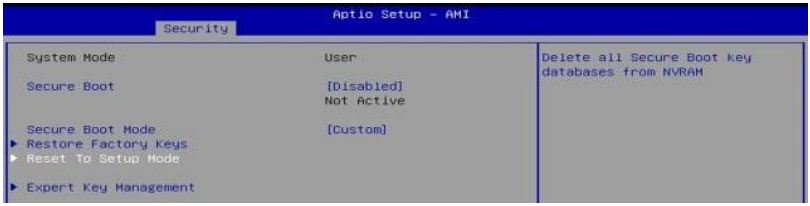
4.5 Security Settings

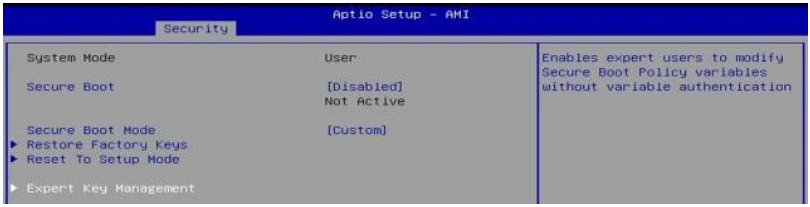
BIOS Setting	Description
Setup Administrator Password	Sets an administrator password for the setup utility.
User Password	Sets a user password.
HDD Security Configuration	HDD Security Configuration for selected drive.
Secure Boot	Secure Boot feature is Active if Secure Boot is enabled. Platform Key(PK) is enrolled and the system is in user mode. The mode change requires platform reset.
Secure Boot Mode	Secure Boot mode options: Standard or Custom. In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication.
Restore Factory Keys	Forces system to user mode. Install factory default Secure Boot key databases.
Reset to Setup Mode	Delete all Secure Boot key databases from NVRAM
Expert Key Management	Enables expert users to modify Secure Boot Policy variables without full authentication.

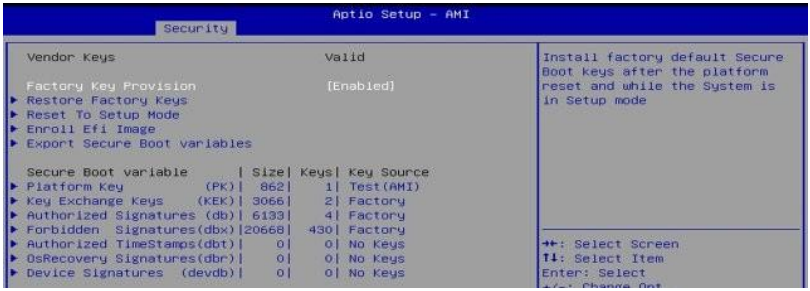

Aptio Setup – AMI
Security
System Mode
User
Secure Boot
[Disabled]
Not Active
Secure Boot Mode
[Custom]
Restore Factory Keys
Reset To Setup Mode
Expert Key Management
Secure Boot feature is Active if Secure Boot is Enabled, Platform Key(PK) is enrolled and the System is in User mode. The mode change requires platform reset

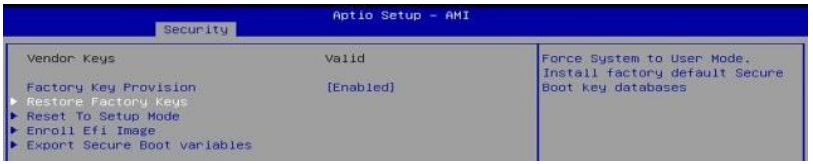

Aptio Setup – AMI
Security
System Mode
User
Secure Boot
[Disabled]
Not Active
Secure Boot Mode
[Custom]
Restore Factory Keys
Reset To Setup Mode
Expert Key Management
Secure Boot mode options: Standard or Custom. In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication

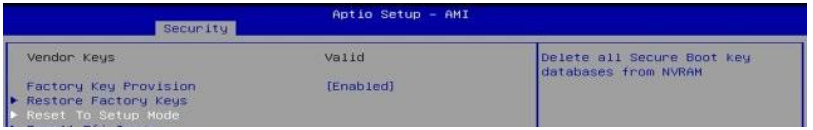

Aptio Setup – AMI
Security
System Mode
User
Secure Boot
[Disabled]
Not Active
Secure Boot Mode
[Custom]
Restore Factory Keys
Reset To Setup Mode
Expert Key Management
Force System to User Mode. Install factory default Secure Boot key databases

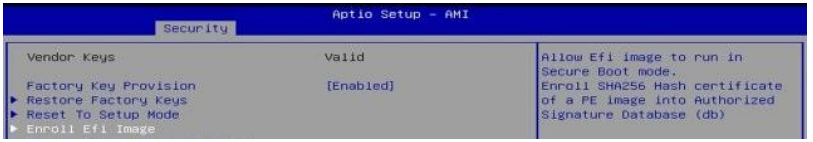

Aptio Setup – AMI
Security
System Mode
User
Secure Boot
[Disabled]
Not Active
Secure Boot Mode
[Custom]
Restore Factory Keys
Reset To Setup Mode
Expert Key Management
Delete all Secure Boot key databases from NVRAM

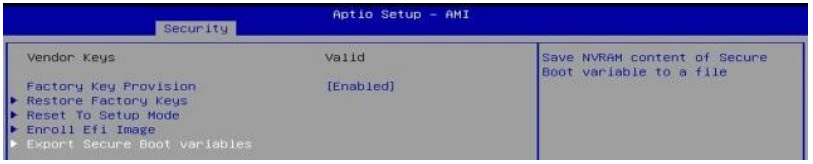

Aptio Setup – AMI
Security
System Mode
User
Secure Boot
[Disabled]
Not Active
Secure Boot Mode
[Custom]
Restore Factory Keys
Reset To Setup Mode
Expert Key Management
Enables expert users to modify Secure Boot Policy variables without variable authentication

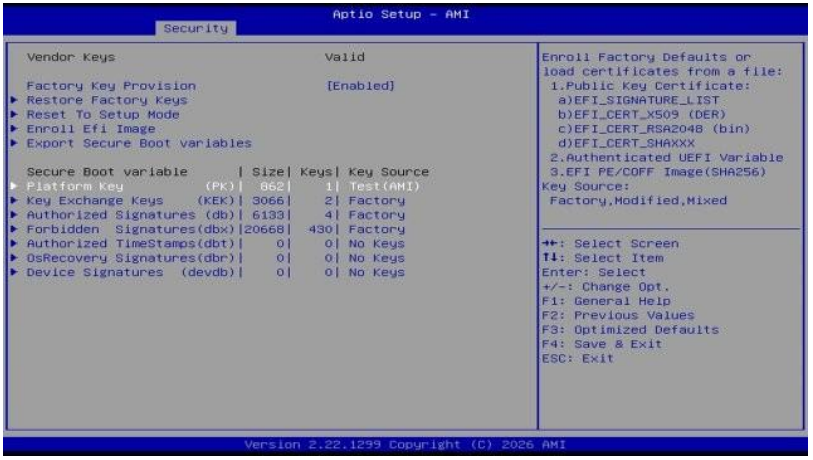

Aptio Setup – AMI
Security
Vendor Keys
Valid
Factory Key Provision
[Enabled]
Restore Factory Keys
Reset To Setup Mode
Enroll Efi Image
Export Secure Boot variables
Secure Boot variable | Size| Keys| Key Source
Platform Key (PK)| 862| 1| Test(AMI)
Key Exchange Keys (KEK)| 3066| 2| Factory
Authorized Signatures (db)| 6133| 4| Factory
Forbidden Signatures(dbx)|20668| 430| Factory
Authorized TimeStamps(dbt)| 0| 0| No Keys
OsRecovery Signatures(dbr)| 0| 0| No Keys
Device Signatures (devdb)| 0| 0| No Keys
Install factory default Secure Boot keys after the platform reset and while the System is in Setup mode
→←: Select Screen
↑↓: Select Item
Enter: Select


Aptio Setup – AMI
Security
Vendor Keys
Valid
Factory Key Provision
[Enabled]
Restore Factory Keys
Reset To Setup Mode
Enroll Efi Image
Export Secure Boot variables
Force System to User Mode. Install factory default Secure Boot key databases

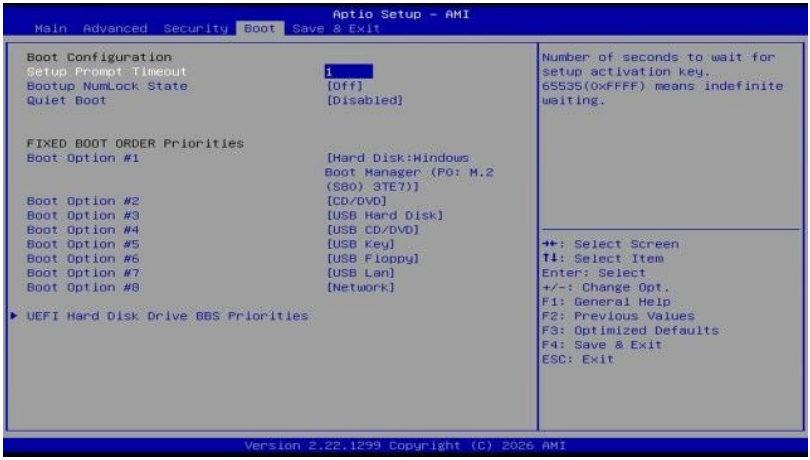

Aptio Setup – AMI
Security
Vendor Keys
Valid
Factory Key Provision
[Enabled]
Restore Factory Keys
Reset To Setup Mode
Delete all Secure Boot key databases from NVRAM


Aptio Setup – AMI
Security
Vendor Keys
Valid
Factory Key Provision
[Enabled]
Restore Factory Keys
Reset To Setup Mode
Enroll Efi Image
Allow Efi image to run in Secure Boot mode. Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db)


Aptio Setup – AMI
Security
Vendor Keys
Valid
Factory Key Provision
[Enabled]
Restore Factory Keys
Reset To Setup Mode
Enroll Efi Image
Export Secure Boot variables
Save NVRAM content of Secure Boot variable to a file


Aptio Setup – AMI
Security
Vendor Keys
Valid
Factory Key Provision
[Enabled]
Restore Factory Keys
Reset To Setup Mode
Enroll Efi Image
Export Secure Boot variables
Secure Boot variable | Size| Keys| Key Source
Platform Key (PK)| 862| 1| Test(AMI)
Key Exchange Keys (KEK)| 3066| 2| Factory
Authorized Signatures (db)| 6133| 4| Factory
Forbidden Signatures(dbx)|20668| 430| Factory
Authorized TimeStamps(dbt)| 0| 0| No Keys
OsRecovery Signatures(dbr)| 0| 0| No Keys
Device Signatures (devdb)| 0| 0| No Keys
Enroll Factory Defaults or load certificates from a file:
1.Public Key Certificate:
a)EFI_SIGNATURE_LIST
b)EFI_CERT_X509 (DER)
c)EFI_CERT_RSA2048 (bin)
d)EFI_CERT_SHAXXX
2.Authenticated UEFI Variable
3.EFI PE/COFF Image(SHA256)
Key Source:
Factory,Modified,Mixed
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1299 Copyright (C) 2026 AMI

4.6 Boot Settings



BIOS Setting	Description
Setup Prompt Timeout	Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.
Bootup NumLock State	Selects the keyboard NumLock state.
Quiet Boot	Enables / Disables Quiet Boot option.
FIXED BOOT ORDER Priorities	Sets the system boot order.
UEFI Hard Disk Drive BBS Priorities	Specifies the Boot Device Priority sequence from available UEFI Hard Disk Drives.

4.7 Save & Exit Settings

BIOS Setting	Description
Save Changes and Exit	Exits system setup after saving the changes.
Discard Changes and Exit	Exits system setup without saving any changes.
Save Changes and Reset	Resets the system after saving the changes.
Discard Changes and Reset	Resets system setup without saving any changes.
Save Changes	Saves changes done so far to any of the setup options.
Discard Changes	Discards changes done so far to any of the setup options.
Restore Defaults	Restores / Loads defaults values for all the setup options.
Save as User Defaults	Saves the changes done so far as User Defaults.
Restore User Defaults	Restores the user defaults to all the setup options.
Launch EFI Shell from filesystem device	Attempts to launch EFI shell application (Shell.efi) from one of the available filesystem devices.

Appendix

This section provides the mapping addresses of peripheral devices and the sample code of watchdog timer configuration.

A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. The following table lists the I/O port addresses used.

Address	Device Description
0x0000EFA0-0x0000EFBF	Intel(R) SMBus - 7E22
0x00000A00-0x00000A0F	Motherboard resources
0x00000A10-0x00000A1F	Motherboard resources
0x00000290-0x0000029F	Motherboard resources
0x0000002E-0x0000002F	Motherboard resources
0x0000004E-0x0000004F	Motherboard resources
0x00000061-0x00000061	Motherboard resources
0x00000063-0x00000063	Motherboard resources
0x00000065-0x00000065	Motherboard resources
0x00000067-0x00000067	Motherboard resources
0x00000070-0x00000070	Motherboard resources
0x00000080-0x00000080	Motherboard resources
0x00000092-0x00000092	Motherboard resources
0x000000B2-0x000000B3	Motherboard resources
0x00000680-0x0000069F	Motherboard resources
0x0000164E-0x0000164F	Motherboard resources
0x00000020-0x00000021	Programmable interrupt controller
0x00000024-0x00000025	Programmable interrupt controller
0x00000028-0x00000029	Programmable interrupt controller
0x0000002C-0x0000002D	Programmable interrupt controller
0x00000030-0x00000031	Programmable interrupt controller
0x00000034-0x00000035	Programmable interrupt controller
0x00000038-0x00000039	Programmable interrupt controller
0x0000003C-0x0000003D	Programmable interrupt controller
0x000000A0-0x000000A1	Programmable interrupt controller
0x000000A4-0x000000A5	Programmable interrupt controller
0x000000A8-0x000000A9	Programmable interrupt controller
0x000000AC-0x000000AD	Programmable interrupt controller
0x000000B0-0x000000B1	Programmable interrupt controller
0x000000B4-0x000000B5	Programmable interrupt controller
0x000000B8-0x000000B9	Programmable interrupt controller
0x000000BC-0x000000BD	Programmable interrupt controller
0x000004D0-0x000004D1	Programmable interrupt controller
0x00004050-0x00004057	Standard SATA AHCI Controller

0x00004040-0x00004043	Standard SATA AHCI Controller
0x00004020-0x0000403F	Standard SATA AHCI Controller
0x000003F8-0x000003FF	Communications Port (COM1)
0x00000000-0x00000CF7	PCI Express Root Complex
0x00000D00-0x0000FFFF	PCI Express Root Complex
0x00000040-0x00000043	System timer
0x00000050-0x00000053	System timer
0x00002000-0x000020FE	Motherboard resources
0x00003000-0x00003FFF	PCI Express Root Port
0x00001854-0x00001857	Motherboard resources

B. Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ 4294967292	Intel(R) USB 3.20 eXtensible Host Controller - 1.20 (Microsoft)
IRQ 4294967272	Intel(R) AI Boost
IRQ 55 ~ 204	Microsoft ACPI-Compliant System
IRQ 256 ~ 511	Microsoft ACPI-Compliant System
IRQ 0	System timer
IRQ 4294967294	PCI Express Root Port
IRQ 4294967291	Intel(R) USB 3.20 eXtensible Host Controller - 1.20 (Microsoft)
IRQ 4294967273	Intel(R) Management Engine Interface #1
IRQ 274 ~ 4294967289	Realtek Gaming 2.5GbE Family Controller
IRQ 14	Intel(R) Serial IO GPIO Host Controller - INTC1083

C. Watchdog Timer Configuration

The Watchdog Timer (WDT) is used to generate a variety of output signals after a user programmable count. The WDT is suitable for use in the prevention of system lock-up, such as when software becomes trapped in a deadlock. Under these sorts of circumstances, the timer will count to zero and the selected outputs will be driven.

Under normal circumstance, you will need to restart the WDT at regular intervals before the timer counts to zero.

Sample Code:

```
//---------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//---------------------------------------------------------------------------
#include <dos.h>
#include <conio.h>
#include <stdio.h>
#include <stdlib.h>
#include " F81804.H"
//---------------------------------------------------------------------------
int main (int argc, char *argv[]);
void EnableWDT(int);
void DisableWDT(void);
//---------------------------------------------------------------------------
int main (int argc, char *argv[])
{
        unsigned char bBuf;
        unsigned char bTime;
        char **endptr;

        char SIO;

        printf("Fintek 81866 watch dog program\n");
        SIO = Init_ F81804();
        if (SIO == 0)
        {
                printf("Can not detect Fintek 81866, program abort.\n");
                return(1);
        }//if (SIO == 0)

        if (argc != 2)
        {
                printf(" Parameter incorrect!!\n");
                return (1);
        }
```

```
        bTime = strtol (argv[1], endptr, 10);
        printf("System will reset after %d seconds\n", bTime);

        if (bTime)
        {       EnableWDT(bTime); }
        else
        {       DisableWDT();}
        return 0;
}
//-----------------------------------------------------------------------
void EnableWDT(int interval)
{
        unsigned char bBuf;

        bBuf = Get_ F81804_Reg(0x2B);
        bBuf &= (~0x20);
        Set_ F81804_Reg(0x2B,   bBuf);          //Enable WDTO

        Set_ F81804_LD(0x07);                   //switch to logic device 7
        Set_ F81804_Reg(0x30,   0x01);          //enable timer

        bBuf = Get_ F81804_Reg(0xF5);
        bBuf &= (~0x0F);
        bBuf |= 0x52;
        Set_ F81804_Reg(0xF5,   bBuf);          //count mode is second

        Set_ F81804_Reg(0xF6,   interval);      //set timer

        bBuf = Get_ F81804_Reg(0xFA);
        bBuf |= 0x01;
        Set_ F81804_Reg(0xFA,   bBuf);          //enable WDTO output

        bBuf = Get_ F81804_Reg(0xF5);
        bBuf |= 0x20;
        Set_ F81804_Reg(0xF5,   bBuf);          //start counting
}
//-----------------------------------------------------------------------
void DisableWDT(void)
{
        unsigned char bBuf;

        Set_ F81804_LD(0x07);                   //switch to logic device 7

        bBuf = Get_ F81804_Reg(0xFA);
        bBuf &= ~0x01;
        Set_ F81804_Reg(0xFA,   bBuf);          //disable WDTO output

        bBuf = Get_ F81804_Reg(0xF5);
        bBuf &= ~0x20;
        bBuf |= 0x40;
        Set_ F81804_Reg(0xF5,   bBuf);          //disable WDT
}
//-----------------------------------------------------------------------


//-----------------------------------------------------------------------
//
```

```
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//---------------------------------------------------------------------------
#include " F81804.H"
#include <dos.h>
//---------------------------------------------------------------------------
unsigned int F81804_BASE;
void Unlock_ F81804 (void);
void Lock_ F81804 (void);
//---------------------------------------------------------------------------
unsigned int Init_ F81804(void)
{
        unsigned int result;
        unsigned char ucDid;

         F81804_BASE = 0x4E;
        result =  F81804_BASE;

        ucDid = Get_ F81804_Reg(0x20);
        if (ucDid == 0x07)                      //Fintek 81866
        {       goto Init_Finish;               }

         F81804_BASE = 0x2E;
        result =  F81804_BASE;

        ucDid = Get_ F81804_Reg(0x20);
        if (ucDid == 0x07)                      //Fintek 81866
        {       goto Init_Finish;               }

         F81804_BASE = 0x00;
        result =  F81804_BASE;

Init_Finish:
        return (result);
}
//---------------------------------------------------------------------------
void Unlock_ F81804 (void)
{
        outportb( F81804_INDEX_PORT,  F81804_UNLOCK);
        outportb( F81804_INDEX_PORT,  F81804_UNLOCK);
}
//---------------------------------------------------------------------------
void Lock_ F81804 (void)
{
        outportb( F81804_INDEX_PORT,  F81804_LOCK);
}
//---------------------------------------------------------------------------
void Set_ F81804_LD( unsigned char LD)
{
        Unlock_ F81804();
        outportb( F81804_INDEX_PORT,  F81804_REG_LD);
        outportb( F81804_DATA_PORT, LD);
        Lock_ F81804();
}
```

```
//---------------------------------------------------------------------------
void Set_ F81804_Reg( unsigned char REG, unsigned char DATA)
{
                Unlock_ F81804();
                outportb( F81804_INDEX_PORT, REG);
                outportb( F81804_DATA_PORT, DATA);
                Lock_ F81804();
}
//---------------------------------------------------------------------------
unsigned char Get_ F81804_Reg(unsigned char REG)
{
                unsigned char Result;
                Unlock_ F81804();
                outportb( F81804_INDEX_PORT, REG);
                Result = inportb( F81804_DATA_PORT);
                Lock_ F81804();
                return Result;
}
//---------------------------------------------------------------------------
```

```
//---------------------------------------------------------------------------
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//---------------------------------------------------------------------------
#ifndef    F81804_H
#define    F81804_H                          1
//---------------------------------------------------------------------------
#define          F81804_INDEX_PORT       ( F81804_BASE)
#define          F81804_DATA_PORT        ( F81804_BASE+1)
//---------------------------------------------------------------------------
#define          F81804_REG_LD           0x07
//---------------------------------------------------------------------------
#define          F81804_UNLOCK           0x87
#define          F81804_LOCK             0xAA
//---------------------------------------------------------------------------
unsigned int Init_ F81804(void);
void Set_ F81804_LD( unsigned char);
void Set_ F81804_Reg( unsigned char,
unsigned char); unsigned char
Get_ F81804_Reg( unsigned char);
//---------------------------------------------------------------------------
#endif  //   F81804_H
```

D. USB Power Control Mapping

PDPC (Peripheral Device Power Control) allows users to turn off the external power and restart it via software, enabling the external device to recover and ensuring the system remains operational. Here are the bit-mapping for software SDK.

Function	Connector	Software Mapping
USB	CN1	bit_0