

IEPF-9010S-EY4

IEPF-9012S-EY4

IEP-9010E

IEP-9012E

IEPF-9020S-EY4

IEPF-9022S-EY4

IEP-9020E

IEP-9022E

Version 1.0

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

1. this device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

CALIFORNIA, USA ONLY

The Lithium battery adopted on this motherboard contains Perchlorate, a toxic substance controlled in Perchlorate Best Management Practices (BMP) regulations passed by the California Legislature. When you discard the Lithium battery in California, USA, please follow the related regulations in advance.

“Perchlorate Material-special handling may apply, see www.dtsc.ca.gov/hazardouswaste/perchlorate”

ASRockInd Website: <http://www.asrockind.com>

Important Safety Instructions

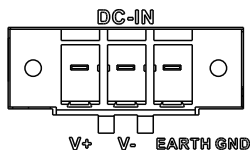
For user safety, please read and follow all instructions, Warnings, Cautions, and Notes marked in this manual and on the associated device before handling/operating the device, to avoid injury or damage.

1. Read these safety instructions carefully.
2. Retain this user manual for future reference.
3. Read the Specifications section of this manual for detailed information on the recommended operating environment.
4. Disconnect the equipment from all AC outlets before cleaning. Use only a damp cloth for cleaning. Do not use liquid or sprayed detergent.
5. Place the equipment on a reliable surface during installation. Dropping or letting the equipment fall may cause damage.
6. Do not leave the equipment in an environment with a storage temperature of below -40 °C (-40 °F) or above 85 °C (185 °F) as this may cause damage. The equipment should be stored in a controlled environment.
7. Ensure that the voltage of the power source is correct before connecting the equipment to a power outlet.
8. Position the power cord away from high-traffic areas. Do not place anything over the power cord.
9. If the equipment is not used for a long time, disconnect the equipment from the power source to avoid damage from transient over-voltage.
10. All cautions and warnings on the equipment should be noted.
11. To avoid electrical shock and/or damage to the device:
 - Keep the device away from water or liquid sources.
 - Keep the device away from high heat or humidity.
 - Keep device properly ventilated (do not block or cover ventilation openings).
 - Always use designated voltage and power source settings.
 - Always install and operate the device near an easily accessible electrical outlet.
 - Secure the power cord (do not place any object on/over the power cord).
 - Only install/attach and operate the device on stable surfaces and/or designated mountings.
 - The power cord must be connected to a socket or outlet with a ground connection.
12. If one of the following occurs, have the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated into the equipment.
 - The equipment has been exposed to moisture.
 - The equipment is malfunctioning or does not operate according to the user manual.
 - The equipment has been dropped and damaged.
 - The equipment shows obvious signs of breakage.

13. Never attempt to repair the device, which should only be serviced by qualified technical personnel using suitable tools.
14. Any unverified component may cause unexpected damage. To ensure correct installation, always use the components (e.g., screws) provided in the accessory box.
15. This equipment is not suitable for use in locations where children are likely to be present.
16. The equipment should only be installed in a restricted access area.
17. Restricted Access Location:

The device must be installed only in a server room or computer room where access is:

- Access can only be gained by service persons or by users who have been instructed about the reasons for the restrictions applied to the location and about any precautions that shall be taken.
 - Access is through the use of a tool or lock and key, or other means of security, and is controlled by the authority responsible for the location.
 - Leave enough clearance (25 inches in the front and 30 inches in the back of the rack) to allow the front door to be opened completely and to allow for sufficient airflow.
 - This product is for installation merely in a Restricted Access Location.
 - This product is not suitable for use with visual display workplace devices according to §2 of "the German Ordinance for Work with Visual Display Units".
18. The equipment is intended to be supplied by the external power source (UL listed/ IEC 60950-1/ IEC 62368-1 approved) whose output complies with ES1/SELV. To reduce potential safety issues, only the AC adapter provided with the product, a replacement AC adapter provided by ASRock Industrial or agency, or an AC adapter purchased as an accessory from ASRock Industrial or agency should be used with the product.
 19. This power adapter (FSP330-AAAN3) is intended to be supplied based on a UL-certified and suitable for use at an operating/storage temperature of 0 °C (32 °F)~ 40 °C (104 °F)/ -20 °C (-4 °F)~80 °C (176 °F), and the current output is rated 13.75A. If you need further assistance, contact ASRock Industrial for additional information.
 20. The ambient temperature of the iEP-9000E series: 70 °C (158°F) max.; the ambient temperature of the iEPF-9000S series: 75 °C (167°F) max.
 21. The terminal block is suitable for V+ & V-, 3 units for each (16~18AWG) which means 6 units in total. The torque value is 0.69Nm. And use copper conductors only. Kindly note that must be installed by a skilled person.



22. LAN port must use shielded LAN cable.

Replaceable Batteries

BURN HAZARD

Hot surface! Do not touch! Touching this surface could result in bodily injury. To reduce risk, allow the surface to cool before touching.

CAUTION

RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS

CAUTION

The equipment is equipped with a battery-powered real-time clock circuit. There is a risk of explosion if a battery is incorrectly replaced. Replace only with the same or equivalent type as designated by the manufacturer. Discard all used batteries according to the manufacturer's instructions.

LITHIUM-METAL BATTERY WARNING

Danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type designated by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

WARNING

All interconnection to the EUT is for indoor location and therefore PoE network interconnected to the EUT is considered as ES1/SELV for connected only to PoE network without routing to the outside plant.

WARNING

Input voltage rated 9~36V, 30~18A

Packing: The unit should be carried with both hands and handled with care.

Maintenance: Use only approved products or a dry applicator to clean and maintain the surfaces.

The terms HDMI™ and HDMI High-Definition Multimedia Interface, and the HDMI logo are trademarks or registered trademarks of HDMI Licensing LLC in the United States and other countries.



Contact Information

If you need to contact ASRock Industrial or want to know more about ASRock Industrial, you're welcome to visit ASRock Industrial's website at www.asrockind.com; or you may contact your dealer for further information.

ASRock Industrial Incorporation

Email: Info_ipc@asrockind.com

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Chapter 1 Introduction

Thank you for purchasing iEPF-9010S-EY4 / iEPF-9012S-EY4 / iEP-9010E / iEP-9012E / iEPF-9020S-EY4 / iEPF-9022S-EY4 / iEP-9020E / iEP-9022E, a reliable barebone system produced under ASRock Industrial's consistently stringent quality control. It delivers excellent performance with robust design conforming to ASRock Industrial's commitment to quality and endurance.



Because the hardware specifications might be updated, the content of this documentation will be subject to change without notice. In case any modifications of this documentation occur, the updated version will be available on ASRock Industrial's website without further notice. If you require technical support related to this product, please visit our website for specific information about the model you are using.

ASRock Industrial's Website: www.ASRockInd.com



The illustrations shown in this manual are examples only. The actual system may differ depending on the product model you purchased.

1.1 Key Features

iEPF-9010S-EY4

- Intel® 12th Gen Core™ Processors with R680E Chipset
- 4 x 260-pin DDR4 SO-DIMM up to 128GB (32GB per DIMM)
- 1 x PCIe x16 (PCIe Gen4), 2 x PCIe x8 (PCIe Gen4), 2 x PCIe x4 (PCIe Gen4)
- 1 x M.2 Key M, 1 x M.2 Key B, 1 x M.2 Key E, 2 x Mini PCIe
- 6 x USB 3.2 Gen2x1, 6 x COM, 4 x SATA3, 8 x DI, 8 x DO
- 5 x Intel 2.5G LAN (2 support PoE, 1 supports vPro)
- 1 x Displayport, 1 x HDMI 2.0b, 1 x VGA
- Powerful Edge AI acceleration enabled by the most flexible mechanical, thermal, and power design, with support for 275mm x 124 mm x 60 mm (L x H x D) max. and up to 255W graphic cards

iEPF-9012S-EY4

- Intel® 12th Gen Core™ Processors with H610 Chipset
- 2 x 260-pin DDR4 SO-DIMM up to 64GB (32GB per DIMM)
- 1 x PCIe x16 (PCIe Gen4), 1 x M.2 Key B, 1 x M.2 Key E, 2 x Mini PCIe
- 2 x USB 3.2 Gen2x1, 2 x USB 3.2 Gen1x1, 2 x USB 2.0, 6 x COM, 4 x SATA3, 8 x DI, 8 x DO
- 4 x Intel 2.5G LAN (2 support PoE)
- 1 x Displayport, 1 x HDMI 2.0b, 1 x VGA

- Powerful Edge AI acceleration enabled by the most flexible mechanical, thermal, and power design, with support for 275mm x 124 mm x 60 mm (L x H x D) max. and up to 255W graphic cards

iEP-9010E

- Intel® 12th Gen Core™ Processors with R680E Chipset
- 4 x 260-pin DDR4 SO-DIMM up to 128GB (32GB per DIMM)
- 1 x M.2 Key M, 1 x M.2 Key B, 1 x M.2 Key E, 2 x Mini PCIe
- 6 x USB 3.2 Gen2x1, 6 x COM, 4 x SATA3, 8 x DI, 8 x DO
- 5 x Intel 2.5G LAN (2 support PoE, 1 supports vPro)
- 1 x Displayport, 1 x HDMI 2.0b, 1 x VGA

iEP-9012E

- Intel® 12th Gen Core™ Processors with H610 Chipset
- 2 x 260-pin DDR4 SO-DIMM up to 64GB (32GB per DIMM)
- 1 x M.2 Key B, 1 x M.2 Key E, 2 x Mini PCIe
- 2 x USB 3.2 Gen2x1, 2 x USB 3.2 Gen1x1, 2 x USB 2.0, 6 x COM, 4 x SATA3, 8 x DI, 8 x DO
- 4 x Intel 2.5G LAN (2 support PoE)
- 1 x Displayport, 1 x HDMI 2.0b, 1 x VGA



The LAN ports also supporting IEEE 802.3AT PoE (PoE output max 30W/port) only use 12~36V DC insource.

iEPF-9020S-EY4

- Intel® 13th Gen Core™ Processors with R680E Chipset
- 4 x 260-pin DDR4 SO-DIMM up to 128GB (32GB per DIMM)
- 1 x PCIe x16 (PCIe Gen4) or 2 x PCIe x8 (PCIe Gen4), 2 x PCIe x4 (PCIe Gen4)
- 1 x M.2 Key M, 1 x M.2 Key B, 1 x M.2 Key E, 2 x Mini PCIe
- 6 x USB 3.2 Gen2x1, 6 x COM, 4 x SATA3, 8 x DI, 8 x DO
- 5 x Intel 2.5G LAN (2 support PoE, 1 supports vPro)
- 1 x Displayport, 1 x HDMI 2.0b, 1 x VGA
- Powerful Edge AI acceleration enabled by the most flexible mechanical, thermal, and power design, with support for 275mm x 124 mm x 60 mm (L x H x D) max. and up to 255W graphic cards

iEPF-9022S-EY4

- Intel® 13th Gen Core™ Processors with H610 Chipset
- 2 x 260-pin DDR4 SO-DIMM up to 64GB (32GB per DIMM)

- 1 x PCIe x16 (PCIe Gen4), 1 x M.2 Key B, 1 x M.2 Key E, 2 x Mini PCIe
- 2 x USB 3.2 Gen2x1, 2 x USB 3.2 Gen1x1, 2 x USB 2.0, 6 x COM, 4 x SATA3, 8 x DI, 8 x DO
- 4 x Intel 2.5G LAN (2 support PoE)
- 1 x Displayport, 1 x HDMI 2.0b, 1 x VGA
- Powerful Edge AI acceleration enabled by the most flexible mechanical, thermal, and power design, with support for 275mm x 124 mm x 60 mm (L x H x D) max. and up to 255W graphic cards

iEP-9020E

- Intel® 13th Gen Core™ Processors with R680E Chipset
- 4 x 260-pin DDR4 SO-DIMM up to 128GB (32GB per DIMM)
- 1 x M.2 Key M, 1 x M.2 Key B, 1 x M.2 Key E, 2 x Mini PCIe
- 6 x USB 3.2 Gen2x1, 6 x COM, 4 x SATA3, 8 x DI, 8 x DO
- 5 x Intel 2.5G LAN (2 support PoE, 1 supports vPro)
- 1 x Displayport, 1 x HDMI 2.0b, 1 x VGA

iEP-9022E

- Intel® 13th Gen Core™ Processors with H610 Chipset
- 2 x 260-pin DDR4 SO-DIMM up to 64GB (32GB per DIMM)
- 1 x M.2 Key B, 1 x M.2 Key E, 2 x Mini PCIe
- 2 x USB 3.2 Gen2x1, 2 x USB 3.2 Gen1x1, 2 x USB 2.0, 6 x COM, 4 x SATA3, 8 x DI, 8 x DO
- 4 x Intel 2.5G LAN (2 support PoE)
- 1 x Displayport, 1 x HDMI 2.0b, 1 x VGA

1.2 Package List

iEP(F)-9010 Series

Item	Quantity
iEPF-9010S Series / iEP-9010E Series	1
Rubber foot	4
M3x8L Round Head Bolts for Rubber foot	4
Desk Mount	2
M3x5L Countersunk Screws for Desk Mount	8
M4x10L Round Head Bolts for Desk Mount	4
M3x4L Round Head Bolts for SODIMM Bracket	4
Terminal Block 1X3P ST 7.62m	1
Terminal Block 1X3P ST 5.0m	1
Terminal Block 1X10P ST 3.5m	2
Screw for M.2 I-Head M2*2	3
Screw for MiniPCIe 3.7xM2.0x3.3L	2
Screw M3*4mm for 2.5" Tray	16
M.2 Heatsink	1
SODIMM Bracket w/Mylar	2
SODIMM Heatsink	2
Nut M2 H=3.35mm w/Thread(Hex)	1
Option: Power Adapter 330W, FSP330-AAAN3 /9NA3300208	1

iEP(F)-9020 Series

Item	Quantity
iEPF-9020S Series / iEP-9020E Series	1
Rubber foot	4
M3x8L Round Head Bolts for Rubber foot	4
Desk Mount	2
M3x5L Countersunk Screws for Desk Mount	8
M4x10L Round Head Bolts for Desk Mount	4

M3x4L Round Head Bolts for SODIMM Bracket	4
Terminal Block 1X3P ST 7.62m	1
Terminal Block 1X3P ST 5.0m	1
Terminal Block 1X10P ST 3.5m	2
Screw for M.2 I-Head M2*2	3
Screw for MiniPCle 3.7xM2.0x3.3L	2
Screw M3*4mm for 2.5" Tray	16
M.2 Heatsink	1
SODIMM Bracket w/Mylar	2
SODIMM Heatsink	2
Nut M2 H=3.35mm w/Thread(Hex)	1
Option: Power Adapter 330W, FSP330-AAAN3 /9NA3300208	1



1. If any items are missing or appear damaged, contact your authorized dealer.
2. Based on different configuration, package list may be different.

Note:

Please refer to the following for more information about the adapter:

330W Power adapter

- Input voltage: 100-240 Vac
- Input frequency: 47-63 Hz(±1Hz)
- Rating output current: 13.75A
- Rating output voltage: 24.0 V ±5%



Actual power consumption may differ based on different applications and different hardware configurations. Sufficient power for the entire system is required to meet these specifications. We recommend that 330W adapter (Certified adapter, Output: 24Vdc, 13.75A) is used if there is no PCIe or PCI add-on cards assembled on the iEPF-9010S Series and iEPF-9020S Series. Users may use a DC source instead of the optional 330W adapter (Certified adapter, Output: 24Vdc, 13.75A) when power consumption is over 330W in an environment where the temperature is 40°C and DC source should be within 9~36 VDC/30~18A.

Ratings: (1) 9-36Vdc, 30-18A (Optional) (2) 24Vdc, 13.75A (Optional)

Kindly refer to 1.3 Specifications "Environment -Operation Temperature" for the related information about CPU.



WARNING! Use ONLY approved NRTL LISTED ITE power supply with electrical ratings.

1.3 Specifications

iEPF-9010S-EY4

Processor System

CPU	Intel® 12 th Gen Core™, Pentium or Celeron Processors
Chipset	Intel® R680E
Socket	LGA 1700

Memory

Technology	Dual Channel DDR4 2933MHz (ECC memory supported by R680E + Selected CPU)
Capacity	128 GB (32 GB per DIMM)
Socket	4 x 260-pin SO-DIMM

Graphics

Controller	Intel® UHD Graphics
DisplayPort	DisplayPort 1.4a, DP++ Max resolution up to 4096x2160@60Hz
HDMI	HDMI 2.0b Max resolution up to 4096x2160@60Hz
VGA	Max resolution up to 1920x1200@60Hz

Expansion Slot

PCIe	1 x PCIe Gen4 x16 (single x16 or dual x8), PCIe x16 slot with default power cable can support up to 180W graphic card (275mm x 111.15 mm x 60 mm (L x H x D), if remove the card holder, it can be limited on 275mm x 124mm x 60 mm) Graphic card can be up to 255W with optional VGA module 1 x PCIe Gen4 x8 (shared with dual x8) 2 x PCIe Gen4 x4
Mini-PCIe	2 x Full/Half size with PCIe Gen3 x1 and USB 2.0
RF& Antenna	8 x SMA connector hole reserved
M.2	1 x M.2 (Key E, 2230) with CNVI/PCIe Gen3 x1 and USB2.0 for Wi-Fi/BT module 1 x M.2 (Key B, 2280/3042/3052) with PCIe Gen3 x1 / USB3.2 Gen1x1 for 4G / 5G
SIM Socket	2 x Nano SIM Card slot (1 connected to Mini PCIe, 1 connected to M.2 Key B)

Audio

Interface	Realtek ALC897, High Definition Audio.
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Ethernet

Controller/ Speed	5 x Intel 2.5G LAN (2 support PoE, each port supports IEEE 802.3AF PoE, PoE output max.15.4W/port),(1 supports vPro)
Connector	5 x RJ45

Storage

M.2	1 x M.2 (Key M, 2280) with Gen4/Gen3 x4 for NVMe SSD
SATA	4 x SATA3 (6Gb/s), support RAID 0/1/5/10 4 x 2.5" HDD/SSD Tray
CFast (Option)	1 x Type II socket (Shared with SATA3)

Front I/O

DisplayPort	1
HDMI	1
VGA	1
Ethernet	5 x 2.5G LAN
USB	6 x USB 3.2 Gen2x1, 1 x USB2.0 internal connector w/ lock function
Audio	1 x Mic-in, 1 x Line-out
COM	4 x RS232/422/485 2 x RS232
DIO	8DIs/8DOs

Watchdog Timer

Output	From Super I/O to drag RESETCON#
Interval	256 Segments, 0, 1, 2, ...255sec

Power Requirements

Input PWR	9V~36V VDC with Ignition control and remote power on/off switch. 80V Surge Protection, OVP, UVP, OCP and reverse protection Ignition Power Input w/ 13-mode condition
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Environment

Operating Temperature	35W CPU: -40°C~75°C (-40°F~167°F) 46W~65W CPU: -40°C~55°C (-40°F~131°F) (with FAN inside, without Add-on Card) (w/ air flow 0.5~0.8 m/s)
Storage Temperature	-40°C~85°C (-40°F~185°F)
Humidity	~95% @ 40°C (non-condensing)
Shock	Operating: 50 G, half sine 11ms duration with SSD
Vibration	Operating: 5 Grms, 5-500 Hz, 3 axes with SSD
ESD	Contact +/-4kV, Air +/-8kV
EMC	EN61000-6-4/-2, CE & FCC Class A
Safety	LVD

Mechanical

Construction	Aluminum heatsink + Metal chassis
Mounting	Desk Mount
Dimensions	202mm (W) x 290mm (D) x 209.3mm (H) (7.95" x 11.42" x 8.24")
Net Weight	10kg

Others

OS Support	Windows 10 & Linux
SW Support	ACRN (https://projectacrn.org/)
TPM	TPM 2.0
Real-Time Enablement	TSN, TCC support under YOCTO

iEPF-9012S-EY4

Processor System

CPU	Intel® 12 th Gen Core™, Pentium or Celeron Processors
Chipset	Intel® H610
Socket	LGA 1700

Memory

Technology	Dual Channel DDR4 2933MHz
Capacity	64 GB (32 GB per DIMM)
Socket	2 x 260-pin SO-DIMM

Graphics

Controller	Intel® UHD Graphics
DisplayPort	DisplayPort 1.4a , DP++ Max resolution up to 4096x2160@60Hz
HDMI	HDMI 2.0b Max resolution up to 4096x2160@60Hz
VGA	Max resolution up to 1920x1200@60Hz

Expansion Slot

PCIe	1 x PCIe Gen4 x16*, PCIe x16 slot with default power cable can support up to 180W graphic card (275mm x 111.15 mm x 60 mm (L x H x D), if remove the card holder, it can be limited on 275mm x 124mm x 60 mm) Graphic card can be up to 255W with optional VGA module
Mini-PCIe	1 x Full/Half size with PCIe Gen3 x1 and USB 2.0 1 x Full/Half size with PCIe Gen3 x1
RF& Antenna	8 x SMA connector hole reserved
M.2	1 x M.2 (Key E, 2230) with CNVi/PCIe Gen3 x1 and USB2.0 for Wi-Fi/BT module 1 x M.2 (Key B, 2280/3042/3052) with PCIe Gen3 x1 / USB2.0 for 4G / 5G
SIM Socket	2 x Nano SIM Card slot (1 connected to Mini PCIe, 1 connected to M.2 Key B)

Audio

Interface	Realtek ALC897, High Definition Audio.
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Ethernet

Controller/ Speed	4x Intel 2.5G LAN(2 support PoE, PoE output max 15.4W/port, each port supports IEEE 802.3AF PoE)
Connector	4x RJ45

Storage

SATA	4 x SATA3 (6Gb/s) 4 x 2.5" HDD/SSD Tray
CFast (Option)	1 x Type II socket (Shared with SATA3)

Rear I/O

DisplayPort	1
HDMI	1
VGA	1
Ethernet	4 x 2.5G LAN
USB	2 x USB 3.2 Gen2x1, 2 x USB 3.2 Gen1x1, 2 x USB 2.0, 1 x USB2.0 internal connector w/ lock function
Audio	1 x Mic-in, 1 x Line-out
COM	4 x RS232/422/485 2 x RS232
DIO	8DIs/8DOs

Watchdog Timer

Output	From Super I/O to drag RESETCON#
Interval	256 Segments, 0, 1, 2, ...255sec

Power Requirements

Input PWR	9V~36V VDC with Ignition control and remote power on/off switch. 80V Surge Protection, OVP, UVP, OCP and reverse protection Ignition Power Input w/ 13-mode condition
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Environment

Operating Temperature	35W CPU: -40°C~75°C (-40°F~167°F) 46W~65W CPU: -40°C~55°C (-40°F~131°F) (with FAN inside, without Add-on Card) (w/ air flow 0.5~0.8 m/s)
Storage Temperature	-40°C~85°C (-40°F~185°F)
Humidity	~95% @ 40°C (non-condensing)
Shock	Operating: 50 G, half sine 11ms duration with SSD
Vibration	Operating: 5 Grms, 5-500 Hz, 3 axes with SSD
ESD	Contact +/-4kV, Air +/-8kV
EMC	EN61000-6-4/-2, CE & FCC Class A
Safety	LVD

Mechanical

Construction	Aluminum heatsink + Metal chassis
Mounting	Desk Mount
Dimensions	202mm (W) x 290mm (D) x 209.3mm (H) (7.95" x 11.42" x 8.24")
Net Weight	10kg

Others

OS Support	Windows 10 & Linux
TPM	TPM 2.0
Real-Time Enablement	TSN, TCC support under YOCTO

*The PCIe x16 slot locates at the third slot from the right hand side.

iEP-9010E

Processor System

CPU	Intel® 12 th Gen Core™, Pentium or Celeron Processors
Chipset	Intel® R680E
Socket	LGA 1700

Memory

Technology	Dual Channel DDR4 2933MHz (ECC memory supported by R680E + Selected CPU)
Capacity	128 GB (32 GB per DIMM)
Socket	4 x 260-pin SO-DIMM

Graphics

Controller	Intel® UHD Graphics
DisplayPort	DisplayPort 1.4a, DP++ Max resolution up to 4096x2160@60Hz
HDMI	HDMI 2.0b Max resolution up to 4096x2160@60Hz
VGA	Max resolution up to 1920x1200@60Hz

Expansion Slot

Mini-PCIe	2 x Full/Half size with PCIe Gen3 x1 and USB 2.0
RF& Antenna	8 x SMA connector hole reserved
M.2	1 x M.2 (Key E, 2230) with CNVi/PCIe Gen3 x1 and USB2.0 for Wi-Fi/BT module 1 x M.2 (Key B, 2280/3042/3052) with PCIe Gen3 x1 / USB3.2 Gen1x1 for 4G / 5G
SIM Socket	2 x Nano SIM Card slot (1 connected to Mini PCIe, 1 connected to M.2 Key B)

Audio

Interface	Realtek ALC897, High Definition Audio.
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Ethernet

Controller/ Speed	5 x Intel 2.5G LAN(2 support PoE, each port supports IEEE 802.3AF PoE, PoE output max:15.4W/port), (1 supports vPro)
Connector	5 x RJ45

Storage

M.2	1 x M.2 (Key M, 2280) with Gen4/Gen3 x4 for NVMe SSD
SATA	4 x SATA3 (6Gb/s), support RAID 0/1/5/10 4 x 2.5" HDD/SSD Tray
CFast (Option)	1 x Type II socket (Shared with SATA3)

Rear I/O

DisplayPort	1
HDMI	1
VGA	1
Ethernet	5 x 2.5G LAN
USB	6 x USB 3.2 Gen2x1, 1 x USB2.0 internal connector w/ lock function
Audio	1 x Mic-in, 1 x Line-out
COM	4 x RS232/422/485 2 x RS232
DIO	8DIs/8DOs

Watchdog Timer

Output	From Super I/O to drag RESETCON#
Interval	256 Segments, 0, 1, 2, ...255sec

Power Requirements

Input PWR	9V~36V VDC with Ignition control and remote power on/off switch. 80V Surge Protection, OVP, UVP, OCP and reverse protection Ignition Power Input w/ 13-mode condition
-----------	---

Environment

Operating Temperature	35W CPU: -40°C~70°C (-40°F~158°F) 46W~65W CPU: -40°C~50°C (-40°F~122°F) (w/ air flow 0.5~0.8 m/s)
Storage Temperature	-40°C~85°C (-40°F~185°F)
Humidity	~95% @ 40°C (non-condensing)
Shock	Operating: 50G, half sine 11ms duration with SSD
Vibration	Operating: 5 Grms, 5-500 Hz, 3 axes with SSD
ESD	Contact +/-4kV, Air +/-8kV
EMC	EN61000-6-4/-2, CE & FCC Class A
Safety	LVD

Mechanical

Construction	Aluminum heatsink + Metal chassis
Mounting	Desk Mount
Dimensions	202mm(W) x 244mm(D) x 108.7mm(H) (7.95" x 9.61" x 4.28")
Net Weight	6.5kg

Others

OS Support	Windows 10 & Linux
SW Support	ACRN (https://projectacrn.org/)
TPM	TPM 2.0
Real-Time Enablement	TSN, TCC support under YOCTO

iEP-9012E

Processor System

CPU	Intel® 12 th Gen Core™, Pentium or Celeron Processors
Chipset	Intel® H610
Socket	LGA 1700

Memory

Technology	Dual Channel DDR4 2933MHz
Capacity	64 GB (32 GB per DIMM)
Socket	2 x 260-pin SO-DIMM

Graphics

Controller	Intel® UHD Graphics
DisplayPort	DisplayPort 1.4a , DP++ Max resolution up to 4096x2160@60Hz
HDMI	HDMI 2.0b Max resolution up to 4096x2160@60Hz
VGA	Max resolution up to 1920x1200@60Hz

Expansion Slot

Mini-PCIe	1 x Full/Half size with PCIe Gen3 x1 and USB 2.0 1 x Full/Half size with PCIe Gen3 x1
RF& Antenna	8 x SMA connector hole reserved
M.2	1 x M.2 (Key E, 2230) with CNVI/PCIe Gen3 x1 and USB2.0 for Wi-Fi/BT module 1 x M.2 (Key B, 2280/3042/3052) with PCIe Gen3 x1 / USB2.0 for 4G / 5G
SIM Socket	2 x Nano SIM Card slot (1 connected to Mini PCIe, 1 connected to M.2 Key B)

Audio

Interface	Realtek ALC897, High Definition Audio.
-----------	--

Ethernet

Controller/ Speed	4 x Intel 2.5G LAN (2 support PoE, each port supports IEEE 802.3AF PoE, PoE output max.15.4W/port)
Connector	4 x RJ45

Storage

SATA	4 x SATA3 (6Gb/s) 4 x 2.5" HDD/SSD Tray
CFast (Option)	1 x Type II socket (Shared with SATA3)

Rear I/O

DisplayPort	1
HDMI	1
VGA	1
Ethernet	4 x 2.5G LAN
USB	2 x USB 3.2 Gen2x1, 2 x USB 3.2 Gen1x1, 2 x USB 2.0, 1 x USB2.0 internal connector w/ lock function
Audio	1 x Mic-in, 1 x Line-out
COM	4 x RS232/422/485 2 x RS232
DIO	8DIs/8DOs

Watchdog Timer

Output	From Super I/O to drag RESETCON#
Interval	256 Segments, 0, 1, 2, ...255sec

Power Requirements

Input PWR	9V-36V VDC with Ignition control and remote power on/off switch. 80V Surge Protection, OVP, UVP, OCP and reverse protection Ignition Power Input w/ 13-mode condition
-----------	---

Environment

Operating Temperature	35W CPU: -40°C~70°C (-40°F~158°F) 46W~65W CPU: -40°C~50°C (-40°F~122°F) (w/ air flow 0.5~0.8 m/s)
Storage Temperature	-40°C~85°C (-40°F~185°F)
Humidity	~95% @ 40°C (non-condensing)
Shock	Operating: 50 G, half sine 11ms duration with SSD
Vibration	Operating: 5 Grms, 5-500 Hz, 3 axes with SSD
ESD	Contact +/-4kV, Air +/-8kV
EMC	EN61000-6-4/-2, CE & FCC Class A
Safety	LVD

Mechanical

Construction	Aluminum heatsink + Metal chassis
Mounting	Desk Mount
Dimensions	202mm (W) x 244mm (D) x 108.7mm (H) (7.95" x 9.61" x 4.28")
Net Weight	6.5kg

Others

OS Support	Windows 10 & Linux
TPM	TPM 2.0
Real-Time Enablement	TSN, TCC support under YOCTO

iEPF-9020S-EY4

Processor System

CPU	Intel® 13 th Gen Core™ Processors
Chipset	Intel® R680E
Socket	LGA 1700

Memory

Technology	Dual Channel DDR4 2933MHz (ECC memory supported by R680E + Selected CPU)
Capacity	128 GB (32 GB per DIMM)
Socket	4 x 260-pin SO-DIMM

Graphics

Controller	Intel® UHD Graphics
DisplayPort	DisplayPort 1.4a, DP++ Max resolution up to 4096x2160@60Hz
HDMI	HDMI 2.0b Max resolution up to 4096x2160@60Hz
VGA	Max resolution up to 1920x1200@60Hz

Expansion Slot

PCIe	1 x PCIe Gen4 x16 (single x16 or dual x8), PCIe x16 slot with default power cable can support up to 180W graphic card (275mm x 111.15 mm x 60 mm (L x H x D), if remove the card holder, it can be limited on 275mm x 124mm x 60 mm) Graphic card can be up to 255W with optional VGA module 1 x PCIe Gen4 x8 (shared with dual x8) 2 x PCIe Gen4 x4
Mini-PCIe	2 x Full/Half size with PCIe Gen3 x1 and USB 2.0
RF& Antenna	8 x SMA connector hole reserved
M.2	1 x M.2 (Key E, 2230) with CNVi/PCIe Gen3 x1 and USB2.0 for Wi-Fi/BT module 1 x M.2 (Key B, 2280/3042/3052) with PCIe Gen3 x1 / USB3.2 Gen1x1 for 4G / 5G
SIM Socket	2 x Nano SIM Card slot (1 connected to Mini PCIe, 1 connected to M.2 Key B)

Audio

Interface	Realtek ALC897, High Definition Audio.
-----------	--

Ethernet

Controller/ Speed	5 x Intel 2.5G LAN (2 support PoE, each port supports IEEE 802.3AF PoE, PoE output max.15.4W/port), (1 supports vPro)
Connector	5 x RJ45

Storage

M.2	1 x M.2 (Key M, 2280) with Gen4/Gen3 x4 for NVMe SSD
SATA	4 x SATA3 (6Gb/s), support RAID 0/1/5/10 4 x 2.5" HDD/SSD Tray
CFast (Option)	1 x Type II socket (Shared with SATA3)

Front I/O

DisplayPort	1
HDMI	1
VGA	1
Ethernet	5 x 2.5G LAN
USB	6 x USB 3.2 Gen2x1, 1 x USB2.0 internal connector w/ lock function
Audio	1 x Mic-in, 1 x Line-out
COM	4 x RS232/422/485 2 x RS232
DIO	8DIs/8DOs

Watchdog Timer

Output	From Super I/O to drag RESETCON#
Interval	256 Segments, 0, 1, 2, ...255sec

Power Requirements

Input PWR	9V~36V VDC with Ignition control and remote power on/off switch. 80V Surge Protection, OVP, UVP, OCP and reverse protection Ignition Power Input w/ 13-mode condition
-----------	---

Environment

Operating Temperature	35W CPU: -40°C~75°C (-40°F~167°F) 46W~65W CPU: -40°C~55°C (-40°F~131°F) (with FAN inside, without Add-on Card) (w/ air flow 0.5~0.8 m/s)
Storage Temperature	-40°C~85°C (-40°F~185°F)
Humidity	~95% @ 40°C (non-condensing)
Shock	Operating: 50 G, half sine 11ms duration with SSD
Vibration	Operating: 5 Grms, 5-500 Hz, 3 axes with SSD
ESD	Contact +/-4kV, Air +/-8kV
EMC	EN61000-6-4/-2, CE & FCC Class A
Safety	LVD

Mechanical

Construction	Aluminum heatsink + Metal chassis
Mounting	Desk Mount
Dimensions	202mm(W) x 290mm(D) x 209.3mm(H) (7.95" x 11.42" x 8.24")
Net Weight	10kg

Others

OS Support	Windows 10 & Linux
TPM	TPM 2.0
Real-Time Enablement	TSN, TCC support under YOCTO

iEPF-9022S-EY4

Processor System

CPU	Intel® 13th Gen Core™ Processors
Chipset	Intel® H610
Socket	LGA 1700

Memory

Technology	Dual Channel DDR4 2933MHz
Capacity	64 GB (32 GB per DIMM)
Socket	2 x 260-pin SO-DIMM

Graphics

Controller	Intel® UHD Graphics
DisplayPort	DisplayPort 1.4a , DP++ Max resolution up to 4096x2160@60Hz
HDMI	HDMI 2.0b Max resolution up to 4096x2160@60Hz
VGA	Max resolution up to 1920x1200@60Hz

Expansion Slot

PCIe	1 x PCIe Gen4 x16 (The PCIe x16 slot locates at the third one from the right hand side)
Mini-PCIe	1 x Full/Half size with PCIe Gen3 x1 and USB 2.0 1 x Full/Half size with PCIe Gen3 x1
RF Antenna	8 x SMA connector hole reserved
M.2	1 x M.2 (Key E, 2230) with CNVi/PCIe Gen3 x1 and USB2.0 for Wi-Fi/BT module 1 x M.2 (Key B, 2280/3042/3052) with PCIe Gen3 x1 / USB2.0 for 4G / 5G
SIM Socket	2 x Nano SIM Card slot (1 connected to Mini PCIe, 1 connected to M.2 Key B)

Audio

Interface	Realtek ALC897, High Definition Audio.
-----------	--

Ethernet

Controller/ Speed	4 x Intel 2.5G LAN (2 support PoE, PoE output max.15.4W/port, each port supports IEEE 802.3AF PoE)
Connector	4 x RJ45

Storage

SATA	4 x SATA3 (6Gb/s) 4 x 2.5" HDD/SSD Tray
CFast (Option)	1 x Type II socket (Shared with SATA3)

Front I/O

DisplayPort	1
HDMI	1
VGA	1
Ethernet	4 x 2.5G LAN
USB	2 x USB 3.2 Gen2x1, 2 x USB 3.2 Gen1x1, 2 x USB 2.0 (1 x USB2.0 internal connector w/ lock function)
Audio	1 x Mic-in, 1 x Line-out
COM	4 x RS232/422/485
	2 x RS232
DIO	8DIs/8DOs

Watchdog Timer

Output	From Super I/O to drag RESETCON#
Interval	256 Segments, 0, 1, 2, ...255sec

Power Requirements

Input PWR	9V~36V VDC with Ignition control and remote power on/off switch. 80V Surge Protection, OVP, UVP, OCP and reverse protection Ignition Power Input w/ 13-mode condition
-----------	---

Environment

Operating Temperature	35W CPU: -40°C~75°C (-40°F~167°F) 46W~65W CPU: -40°C~55°C (-40°F~131°F) (with FAN inside, without Add-on Card) (w/ air flow 0.5~0.8 m/s)
Storage Temperature	-40°C~85°C (-40°F~185°F)
Humidity	~95% @ 40°C (non-condensing)
Shock	Operating: 50 G, half sine 11ms duration with SSD
Vibration	Operating: 5 Grms, 5-500 Hz, 3 axes with SSD
ESD	Contact +/-4kV, Air +/-8kV
EMC	EN61000-6-4/-2, CE & FCC Class A
Safety	LVD

Mechanical

Construction	Aluminum heatsink + Metal chassis
Mounting	Desk Mount
Dimensions	202mm (W) x 290mm (D) x 209.3mm (H) (7.95" x 11.42" x 8.24")
Net Weight	10kg

Others

OS Support	Windows 10 & Linux
TPM	TPM 2.0
Real-Time Enablement	TSN, TCC support under YOCTO

iEP-9020E

Processor System

CPU	Intel® 13th Gen Core™ Processors
Chipset	Intel® R680E
Socket	LGA 1700

Memory

Technology	Dual Channel DDR4 2933MHz (ECC memory supported by R680E + Selected CPU)
Capacity	128 GB (32 GB per DIMM)
Socket	4 x 260-pin SO-DIMM

Graphics

Controller	Intel® UHD Graphics
DisplayPort	DisplayPort 1.4a , DP++ Max resolution up to 4096x2160@60Hz
HDMI	HDMI 2.0b Max resolution up to 4096x2160@60Hz
VGA	Max resolution up to 1920x1200@60Hz

Expansion Slot

Mini-PCIe	2 x Full/Half size with PCIe Gen3 x1 and USB 2.0
RF& Antenna	8 x SMA connector hole reserved
M.2	1 x M.2 (Key E, 2230) with CNVI/PCIe Gen3 x1 and USB2.0 for Wi-Fi/BT module 1 x M.2 (Key B, 2280/3042/3052) with PCIe Gen3 x1 / USB3.2 Gen1x1 for 4G / 5G
SIM Socket	2 x Nano SIM Card slot (1 connected to Mini PCIe, 1 connected to M.2 Key B)

Audio

Interface	Realtek ALC897, High Definition Audio.
-----------	--

Ethernet

Controller/ Speed	5 x Intel 2.5G LAN(2 support PoE, each port supports IEEE 802.3AF PoE, PoE output max.15.4W/port),(1 supports vPro)
Connector	5 x RJ45

Storage

M.2	1 x M.2 (Key M, 2280) with Gen4/Gen3 x4 for NVMe SSD
SATA	4 x SATA3 (6Gb/s), support RAID 0/1/5/10 4 x 2.5" HDD/SSD Tray
CFast (Option)	1 x Type II socket (Shared with SATA3)

Rear I/O

DisplayPort	1
HDMI	1
VGA	1
Ethernet	5 x 2.5G LAN
USB	6 x USB 3.2 Gen2x1, 1 x USB2.0 internal connector w/ lock function
Audio	1 x Mic-in, 1 x Line-out
COM	4 x RS232/422/485
	2 x RS232
DIO	8DIs/8DOs

Watchdog Timer

Output	From Super I/O to drag RESETCON#
Interval	256 Segments, 0, 1, 2, ...255sec

Power Requirements

Input PWR	9V~36V VDC with Ignition control and remote power on/off switch. 80V Surge Protection, OVP, UVP, OCP and reverse protection Ignition Power Input w/ 13-mode condition
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Environment

Operating Temperature	35W CPU: -40°C~70°C (-40°F~158°F) 46W~65W CPU: -40°C~50°C (-40°F~122°F) (w/ air flow 0.5~0.8 m/s)
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Humidity	~95% @ 40°C (non-condensing)
Shock	Operating: 50G, half sine 11ms duration with SSD
Vibration	Operating: 5 Grms, 5-500 Hz, 3 axes with SSD
ESD	Contact +/-4kV, Air +/-8kV
EMC	EN61000-6-4/-2, CE & FCC Class A
Safety	LVD

Mechanical

Construction	Aluminum heatsink + Metal chassis
Mounting	Desk Mount
Dimensions	202mm (W) x 244mm (D) x 108.7mm (H) (7.95" x 9.61" x 4.28")
Net Weight	6.5kg

Others

OS Support	Windows 10 & Linux
TPM	TPM 2.0
Real-Time Enablement	TSN, TCC support under YOCTO

iEP-9022E

Processor System

CPU	Intel® 13th Gen Core™ Processors
Chipset	Intel® H610
Socket	LGA 1700

Memory

Technology	Dual Channel DDR4 2933MHz
Capacity	64 GB (32 GB per DIMM)
Socket	2 x 260-pin SO-DIMM

Graphics

Controller	Intel® UHD Graphics
DisplayPort	DisplayPort 1.4a , DP++ Max resolution up to 4096x2160@60Hz
HDMI	HDMI 2.0b Max resolution up to 4096x2160@60Hz
VGA	Max resolution up to 1920x1200@60Hz

Expansion Slot

Mini-PCIe	1 x Full/Half size with PCIe Gen3 x1 and USB 2.0 1 x Full/Half size with PCIe Gen3 x1
RF Antenna	8 x SMA connector hole reserved
M.2	1 x M.2 (Key E, 2230) with CNVI/PCIe Gen3 x1 and USB2.0 for Wi-Fi/BT module 1 x M.2 (Key B, 2280/3042/3052) with PCIe Gen3 x1 /USB2.0 for 4G / 5G
SIM Socket	2 x Nano SIM Card slot (1 connected to Mini PCIe, 1 connected to M.2 Key B)

Audio

Interface	Realtek ALC897, High Definition Audio.
-----------	--

Ethernet

Controller/ Speed	4 x Intel 2.5G LAN (2 support PoE, PoE output max.15.4W/port, each port supports IEEE 802.3AF PoE)
Connector	4 x RJ45

Storage

SATA	4 x SATA3 (6Gb/s) 4 x 2.5" HDD/SSD Tray
CFast (Option)	1 x Type II socket (Shared with SATA3)

Rear I/O

DisplayPort	1
HDMI	1
VGA	1
Ethernet	4 x 2.5G LAN
USB	2 x USB 3.2 Gen2x1, 2 x USB 3.2 Gen1x1, 2 x USB 2.0, 1 x USB2.0 internal connector w/ lock function
Audio	1 x Mic-in, 1 x Line-out
COM	4 x RS232/422/485 2 x RS232
DIO	8DIs/8DOs

Watchdog Timer

Output	From Super I/O to drag RESETCON#
Interval	256 Segments, 0, 1, 2, ...255sec

Power Requirements

Input PWR	9V~36V VDC with Ignition control and remote power on/off switch. 80V Surge Protection, OVP, UVP, OCP and reverse protection Ignition Power Input w/ 13-mode condition
-----------	---

Environment

Operating Temperature	35W CPU: -40°C~70°C (-40°F~158°F) 46W~65W CPU: -40°C~50°C (-40°F~122°F) (w/ air flow 0.5~0.8 m/s)
Storage Temperature	-40°C~85°C (-40°F~185°F)
Humidity	~95% @ 40°C (non-condensing)
Shock	Operating: 50G, half sine 11ms duration with SSD
Vibration	Operating: 5 Grms, 5-500 Hz, 3 axes with SSD
ESD	Contact +/-4kV, Air +/-8kV
EMC	EN61000-6-4/-2, CE & FCC Class A
Safety	LVD

Mechanical

Construction	Aluminum heatsink + Metal chassis
Mounting	Desk Mount
Dimensions	202mm (W) x 244mm (D) x 108.7mm (H) (7.95" x 9.61" x 4.28")
Net Weight	6.5kg

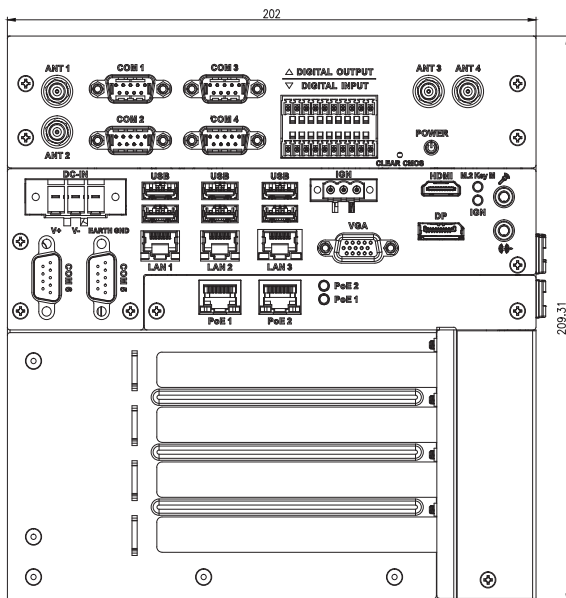
Others

OS Support	Windows 10 & Linux
TPM	TPM 2.0
Real-Time Enablement	TSN, TCC support under YOCTO

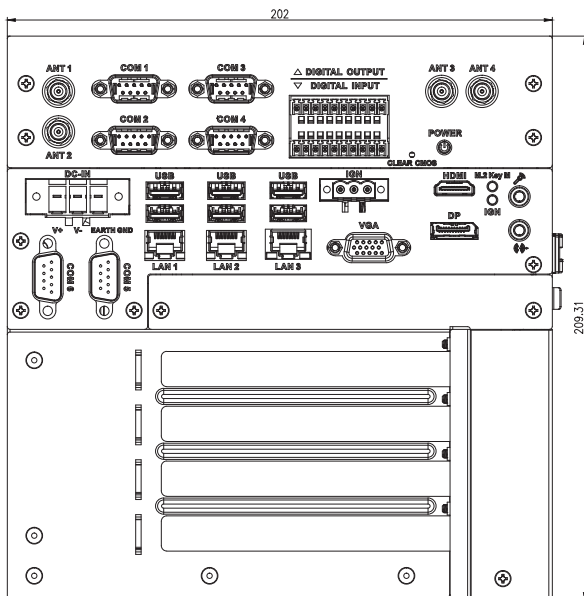
1.4 Dimensions

iEPF-9010S-EY4 / iEPF-9012S-EY4 / iEPF-9020S-EY4 / iEPF-9022S-EY4

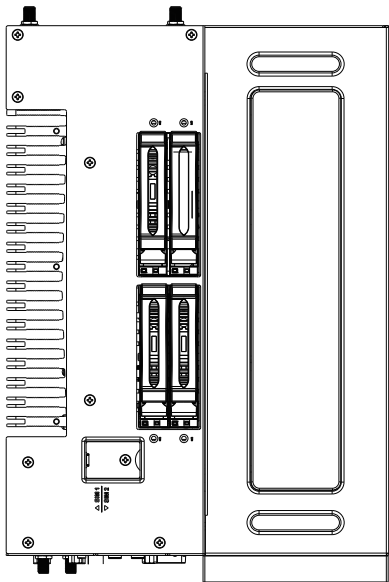
Front View - iEPF-9010S-EY4 / iEPF-9020S-EY4



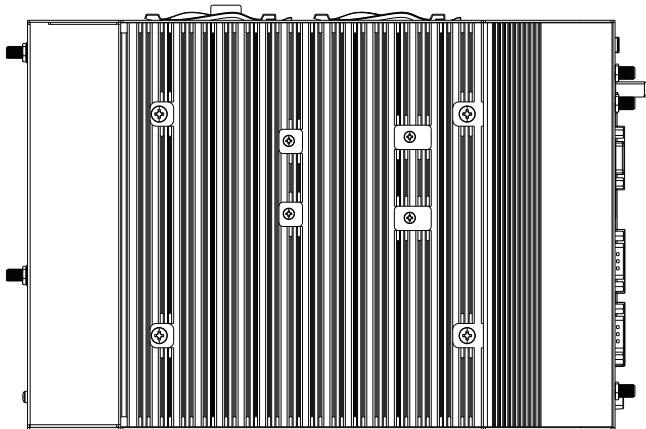
Front View - iEPF-9012S-EY4 / iEPF-9022S-EY4



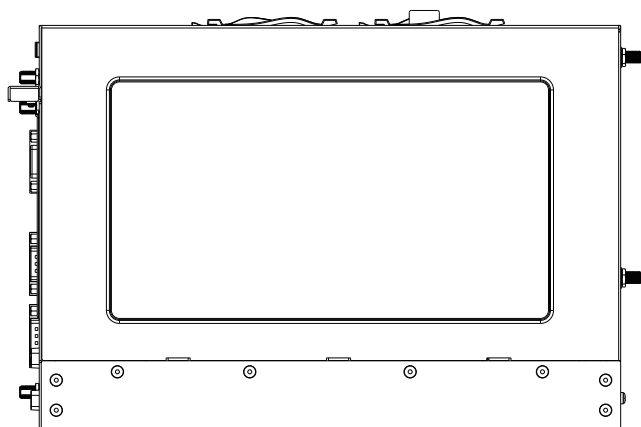
Top View



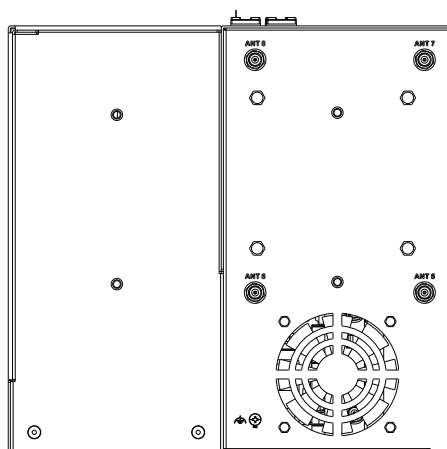
Left-Side View



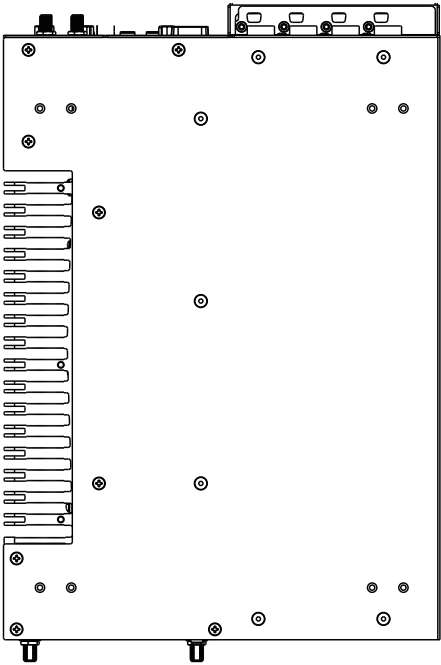
Right-Side View



Rear Side View

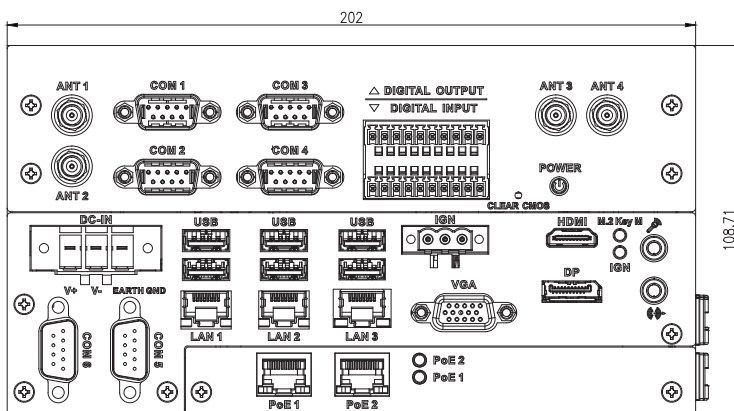


Bottom View

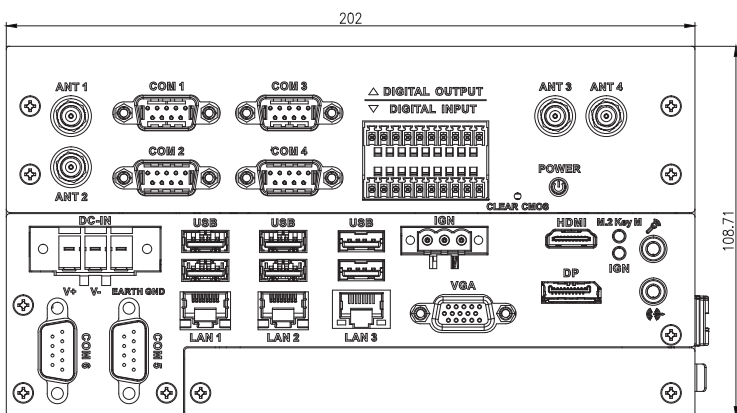


iEP-9010E / iEP-9012E / iEP-9020E / iEP-9022E

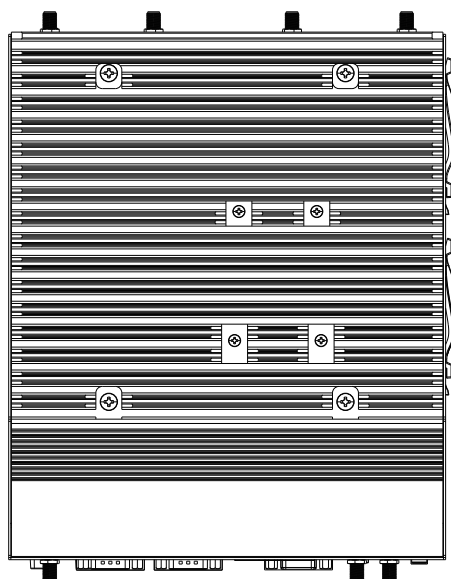
Front View - iEP-9010E / iEP-9020E



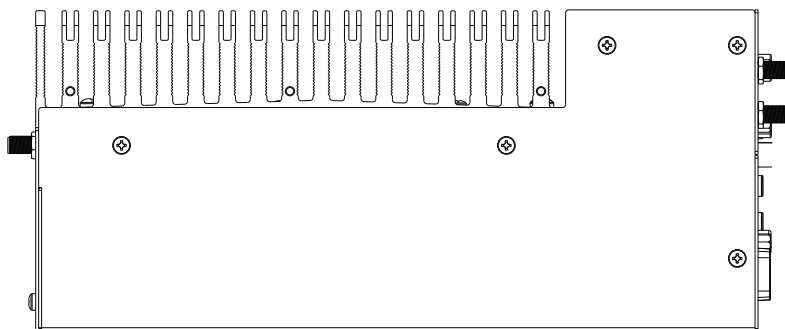
Front View - iEP-9012E / iEP-9022E



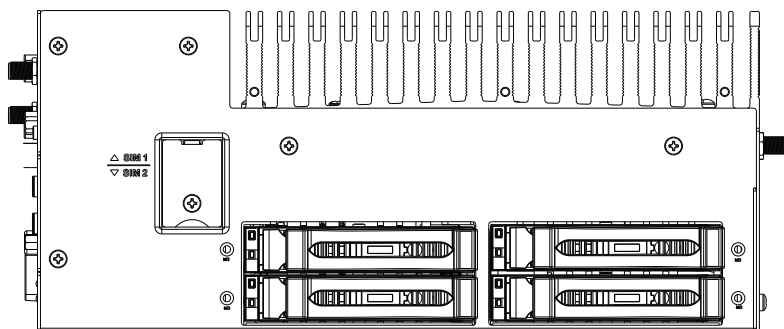
Top View



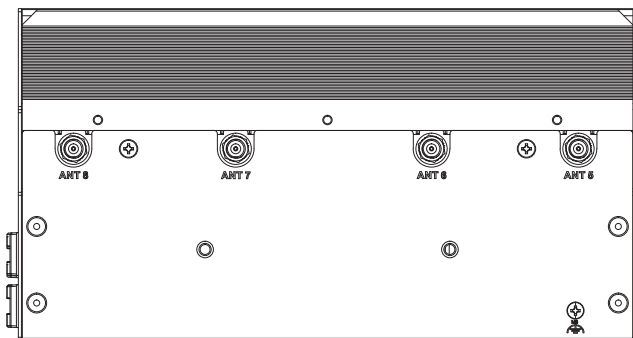
Left-Side View



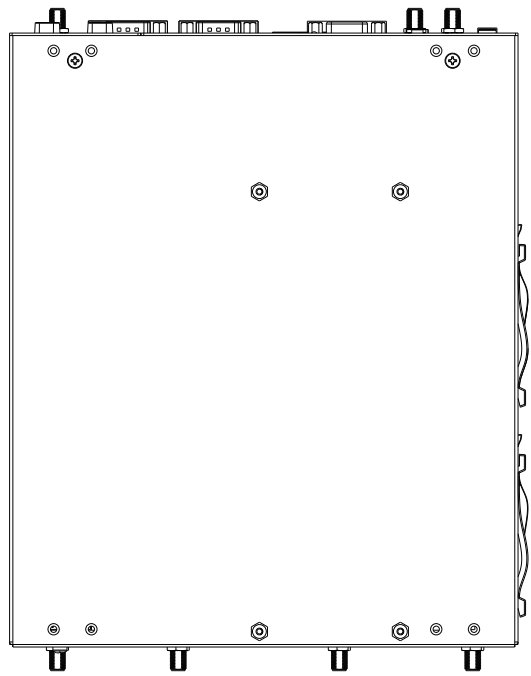
Right-Side View



Rear Side View

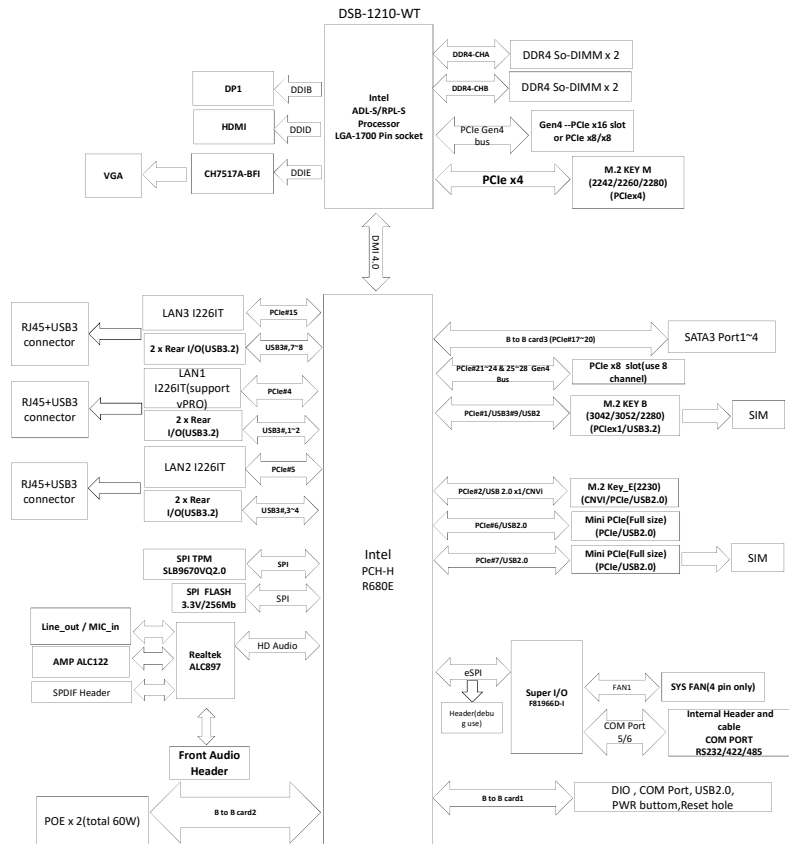


Bottom View

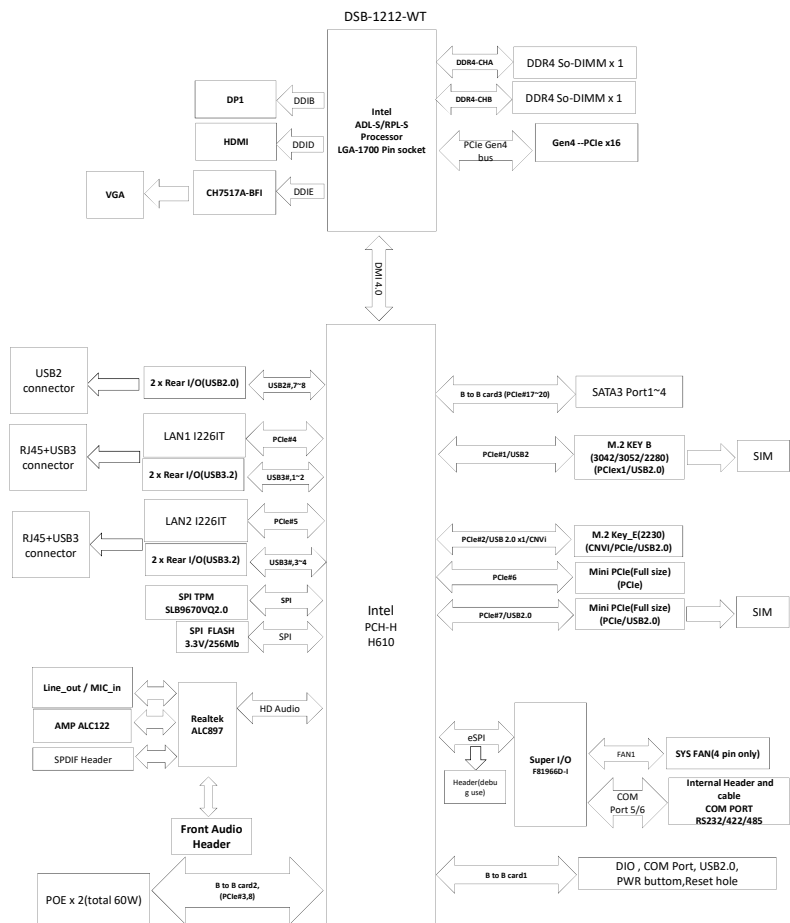


1.5 Block Diagram

iEP(F)-9010&9020 E/S Series



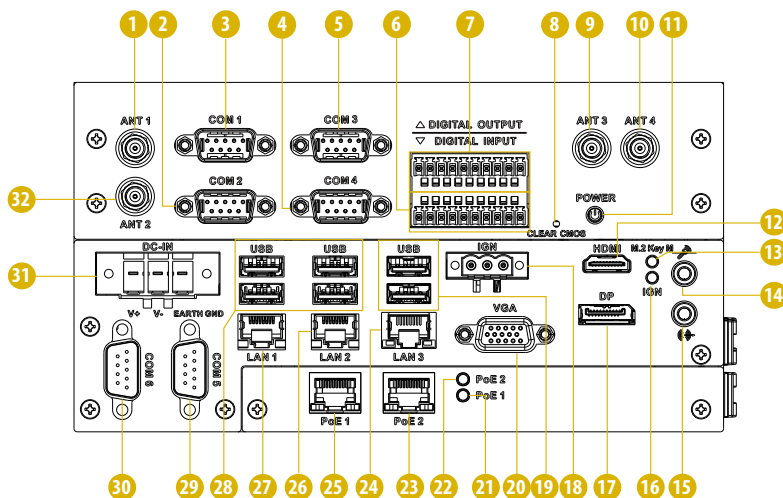
iEP(F)-9012&9022 E/S Series



Chapter 2 System Overview

This chapter provides diagrams showing the location of important components of the system system.

2.1 System Front Panel



No.	Description
1	Antenna Port 1
2	Serial Port (COM 2)
3	Serial Port (COM 1)
4	Serial Port (COM 4)
5	Serial Port (COM 3)
6	Digital Input
7	Digital Output
8	ClearCMOS Button
9	Antenna Port 3
10	Antenna Port 4
11	Power Switch
12	HDMI
13	M.2 Slot (Key M) Status LED
14	Audio (Mic-in)
15	Audio (Line-out)
16	IGN Status LED
17	DisplayPort

18	Remote Power On/Off Switch (IGN)
19	2 x USB 3.2 Gen2x1 Ports (R680E sku) 2 x USB 2.0 Ports (H610 sku)
20	VGA Port
21	PoE1 Port Status LED (PoE 1)
22	PoE2 Port Status LED (PoE 2)
23	LAN RJ-45 PoE Port (PoE 2)
24	LAN RJ-45 Port (LAN 3) (R680E sku)
25	LAN RJ-45 PoE Port (PoE 1)
26	LAN RJ-45 Port (LAN 2)
27	LAN RJ-45 Port (LAN 1)
28	4 x USB 3.2 Gen2x1 Ports (R680E sku) 2 x USB 3.2 Gen2x1 Ports, 2 x USB 3.2 Gen1x1 Ports (H610 sku)
29	Serial Port (COM 5)
30	Serial Port (COM 6)
31	DC Power Input (DC-IN)
32	Antenna Port 2

- The PoE ports on the system are only be linked to the PoE networks in the indoor environment. They would be not connected the networks in the outdoor space.

2.1.1 Control Panel Buttons and LED Indicators

Power Switch

Press the power switch button to toggle the system power-on and power-off modes. To remove all power from the system completely, disconnect the power cord from the system.

ClearCMOS Button

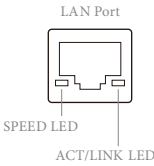
Use this button to manually reset the system. Press and hold the reset switch for a few seconds to reboot the system without shutting it off.

Remote Power On/Off Switch (IGN connector)

This switch is for ignition power control and operation. Use this switch to remotely monitor or turn on/off the ignition signal for in-vehicle applications, for instance.

Ethernet Port LED

There are two LEDs on the LAN port. Please refer to the table below for the LAN port LED indications.



Activity / Link LED		Speed LED	
Status	Description	Status	Description
Off	No Link	Off	10/100Mbps connection
Blinking	Data Activity	Orange	1000Mbps connection
On	Link	Green	2.5Gbps connection

PoE 1 Port Status LED

Status	Description
Solid Green	PoE 1 Port is connected to a PoE device
Off	No PoE onnection

PoE 2 Port Status LED

Status	Description
Solid Green	PoE 2 Port is connected to a PoE device
Off	No PoE connection

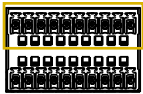
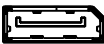
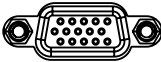
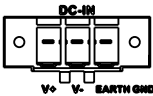
M.2 Slot (Key M) Status LED

Status	Description
Blinking Green	M.2 Slot (Key M) on the motherboard is populated with a M.2 module.
Off	Empty M.2 Slot (Key M)

IGN Status LED

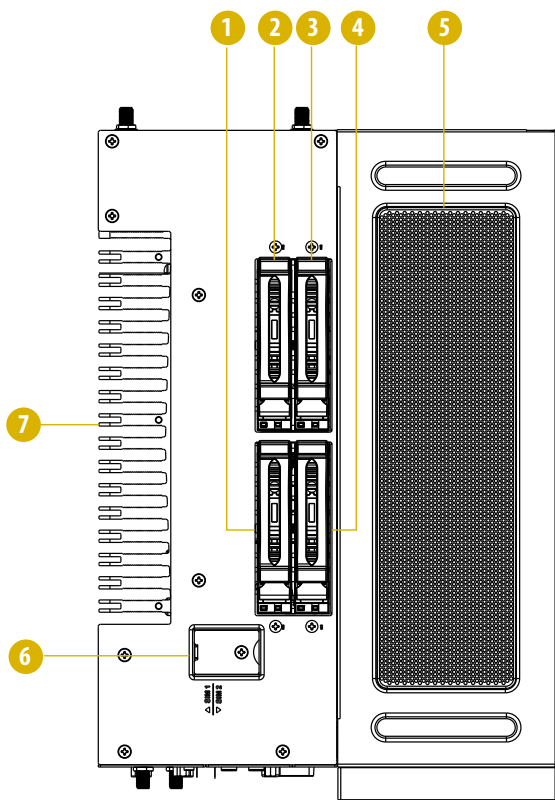
Status	Description
Solid Green	The IGN connector is connected and working normally.
Off	No connection

2.1.2 I/O Connectors

Connector		Description
Antenna Port		Connect the antenna cable to this connector.
Serial Port (COM)		This system provides six COM ports through D-sub 9-pin connectors.
Digital Output		This system provides non-isolation digital input circuits for customer's device.
Digital Input		This system provides non-isolation digital output circuits for customer's device.
DisplayPort 1.4a		Connect this DisplayPort to VGA, DVI, HDMI and DisplayPort monitors via adapter cables.
Audio (Mic-in)		The Mic-in audio connector on the I/O panel supports 5.1 channel HD audio and fully complies with Intel® High Definition Audio (Azalia) specifications.
Audio (Line-out)		Connect stereo speakers to the Line-out connector for better sound quality.
USB 2.0 Port		This system provides two USB 2.0 ports supporting Type A USB connection on the I/O panel.
USB 3.2 Gen1/ Gen2 Port		This system provides four USB 3.2 Gen1/Gen2 ports supporting Type A USB 3.2 connection on the I/O panel.
VGA Port		Use a VGA cable to connect between the system and your monitor.
DC Power Input		Insert a power cable to this connector for power supply.

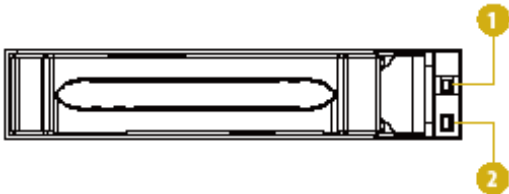
2.2 HDD Panel

iEPF-9010S Series / iEP-9010E Series / iEPF-9020S Series / iEP-9020E Series



No.	Description
1	2.5" HDD/SSD Tray (HDD0)
2	2.5" HDD/SSD Tray (HDD1)
3	2.5" HDD/SSD Tray (HDD3)
4	2.5" HDD/SSD Tray (HDD2)
5	Side Vent
6	2 x SIM Card Slots (SIM1 is for M.2 B key slot)
7	System Heatsink

2.3 Drive Tray LEDs



No. Description	
1	HDD Power LED
2	HDD Activity LED

Status LED Definitions

HDD Power LED	
Status	Description
Blue	HDD powered-on
Off	No power to HDD

HDD Activity LED	
Status	Description
Solid Green	HDD active
Blinking Green	HDD accessing or reading
Red	HDD failed
Off	HDD powered-off

Chapter 3 Hardware Installation and Maintenance

This chapter helps you disassemble the system and install components.

Before You Begin

Before you work with the system, pay close attention to the “Important Safety Instructions” at the beginning of this manual.

1. Make sure the system is powered off.
Power down the system if it is still running.
 - (1) Press the Power button to power off the system. The Power LED at the front turns from solid green to dark.
 - (2) Disconnect the power cord first from the AC outlet and then from the system.
The power LED turns off.
2. Ensure you have a clean and stable working environment. Avoid dust and dirt because contaminants may cause malfunctions.
3. Ground yourself properly before touching any system component. A discharge of static electricity may damage components. Wear a grounded wrist strap if available.

Screw Driver Recommended Torque Value	
Items Secured to Chassis	Vaule (Kgf-cm)
Chassis & Top Case/Heatsink	3.0 + / - 0.5
Rubber Foot	3.0 + / - 0.5
Desk Mount	3.0 + / - 0.5
2.5" Tray and 2.5" Device	3.0 + / - 0.5
Items Secured to PCBA	Vaule (Kgf-cm)
DIMM BKT	2.0 + / - 0.5
Device : M.2 & Mini PCIE Module	2.0 + / - 0.5
Phoenix DC in & IGN	2.0 + / - 0.5

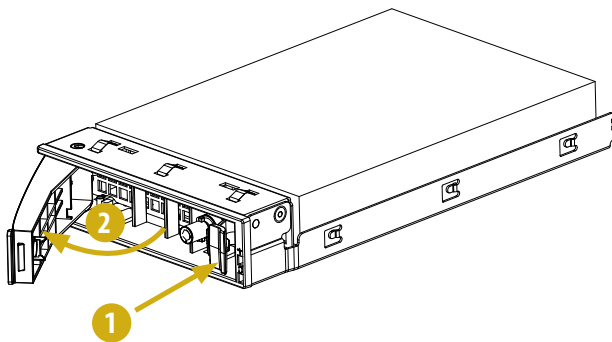
3.1 How to Install the Hard Disk Drive

Installing a Hard Disk Drive into 2.5" Hard Drive Tray

The system supports hot-swappable 2.5" hard drives.

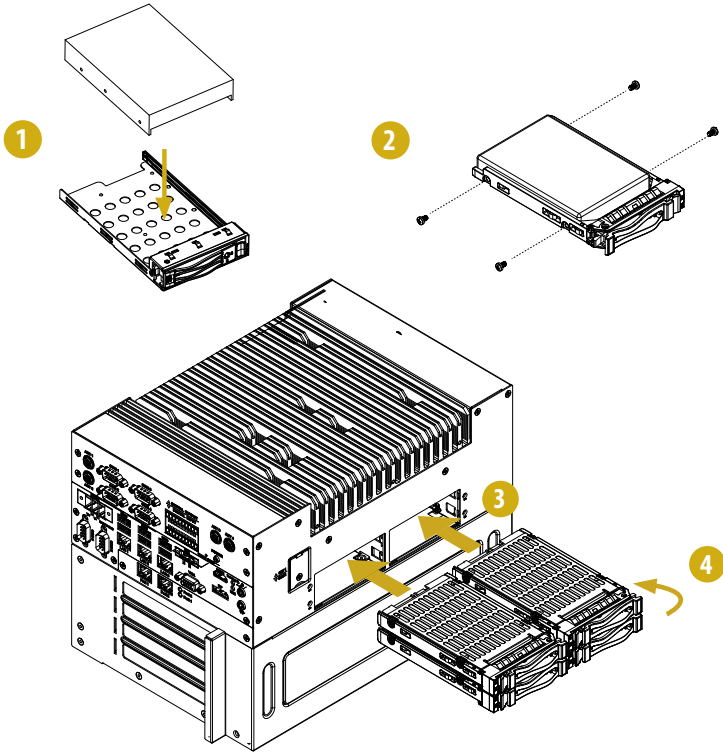
Removing 2.5" Hard Drive Trays from the Chassis

1. Press the locking lever latch on the drive tray to unlock the retention lever.
2. Rotate the lever out and away from the module bay and pull the hard drive out of the HDD tray.



Installing a 2.5" Hard Drive to the Hard Drive Tray

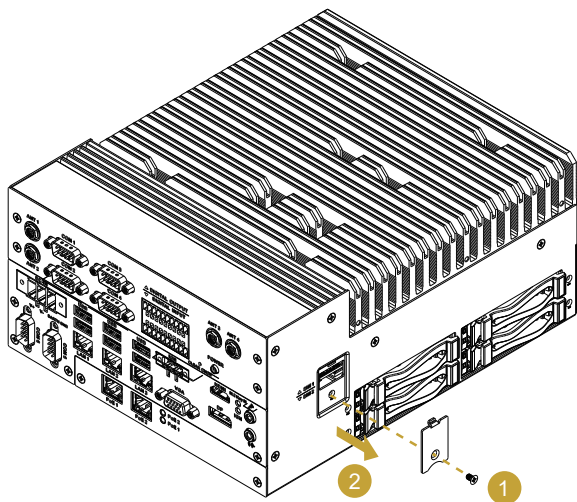
1. Place a 2.5" HDD into the tray with the printed circuit board side facing down.
Carefully align the mounting holes in the hard drive and the tray.
2. Secure the hard drive using four screws.
3. Slide the drive tray into the HDD bay until the drive is fully seated.
4. Push in the locking lever to lock the HDD tray into place.



3.2 How to Install the SIM Card

Installing a SIM Card into a SIM Card Slot

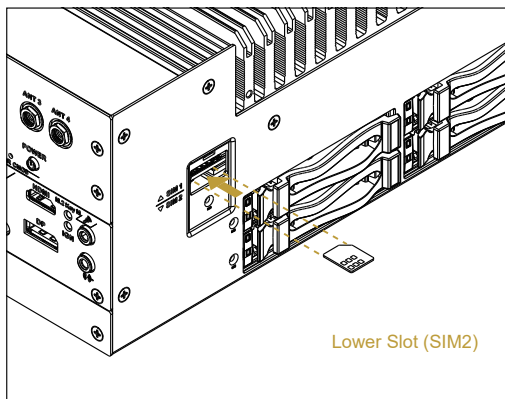
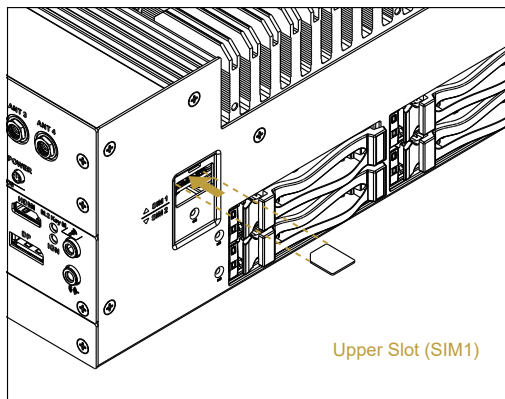
1. Release the screw and remove the SIM card slot cover.



2. Insert a SIM card to the SIM card slot.

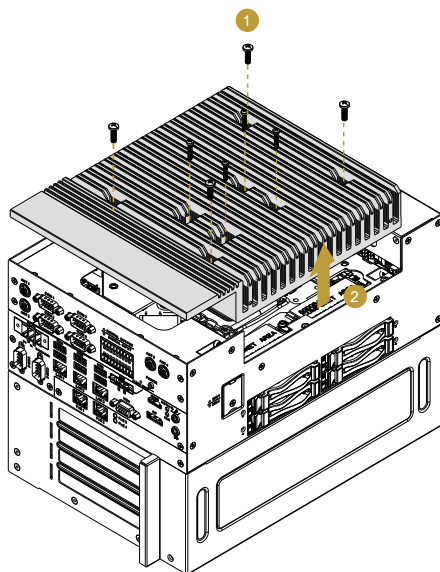
SIM1 (Upper Slot): When inserting the SIM Card to the upper slot, make sure the notch on the SIM card is oriented with the gold contacts face down.

SIM2 (Lower Slot): When inserting the SIM Card to the lower slot, make sure the notch on the SIM card is oriented with the gold contacts face up.

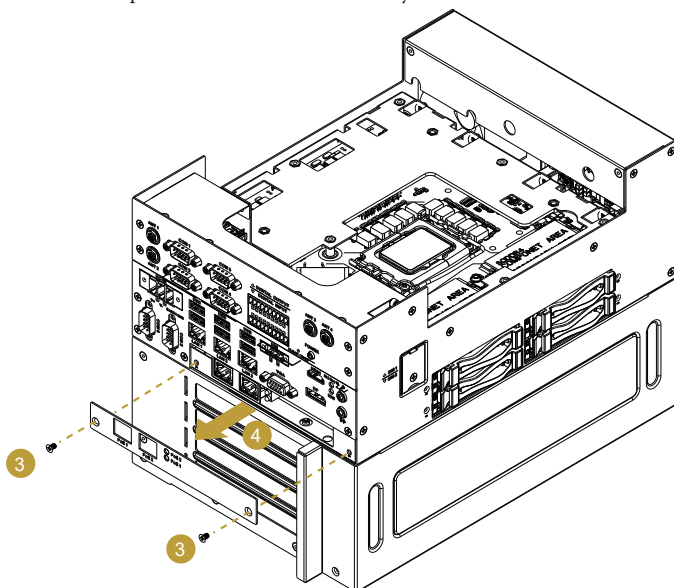


3.3 How to Disassemble the System

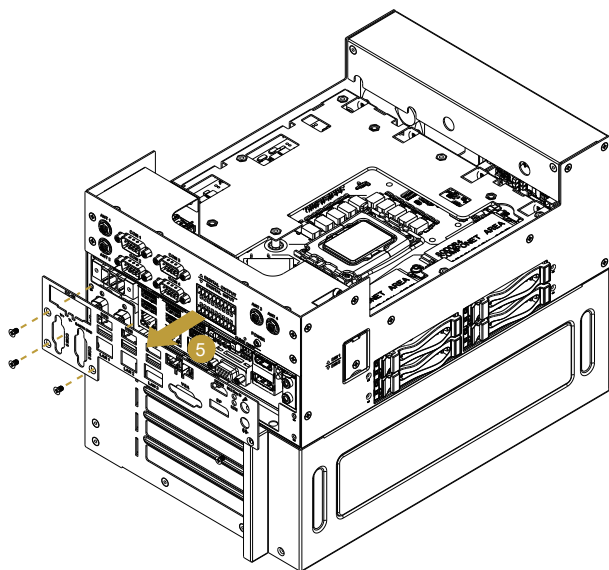
1. Release all screws on the heatsink side
2. Remove the heatsink..



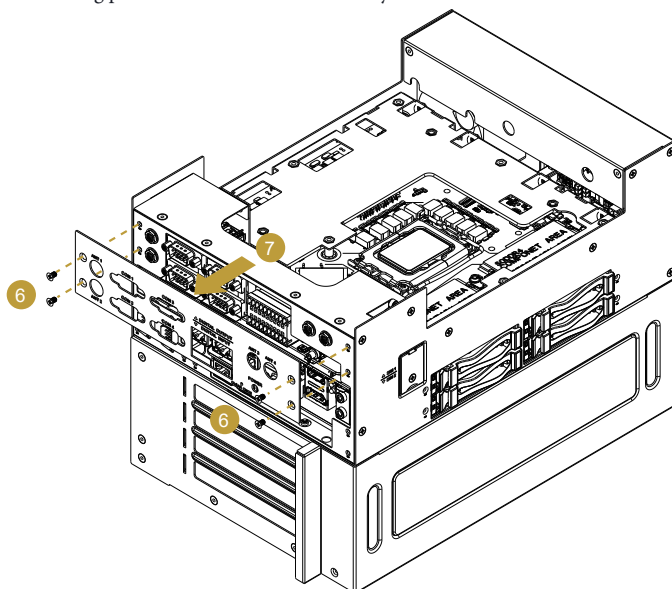
3. Release the screws.
4. Remove the small panel from the I/O side of the system.



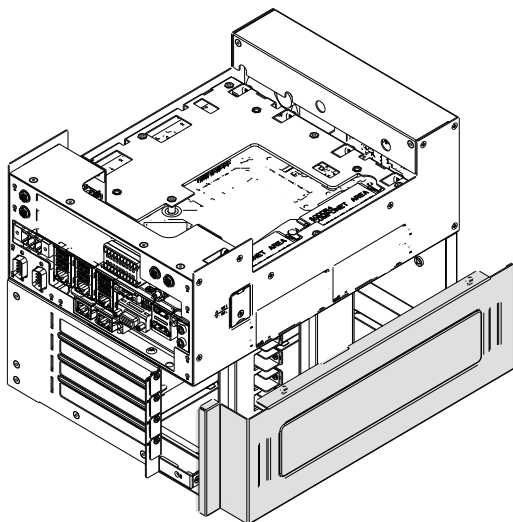
5. Release the screws and remove the middle panel from the I/O side of the system.



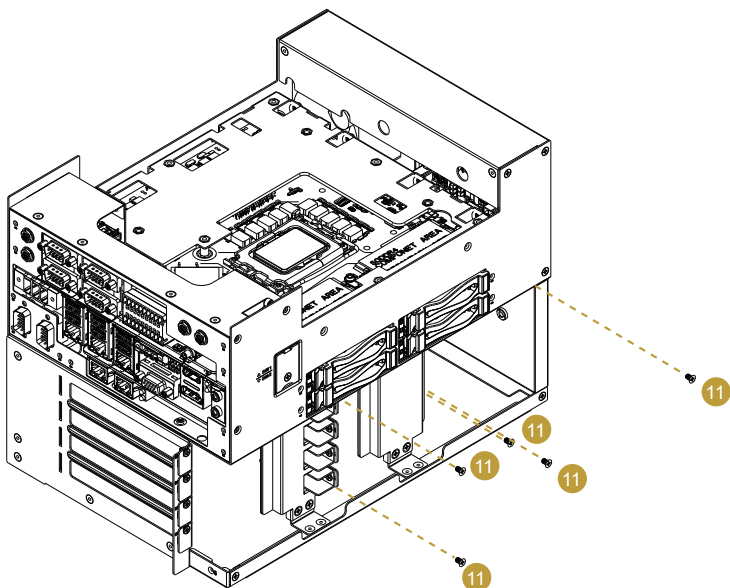
6. Release the screws.
7. Remove the big panel from the I/O side of the system.



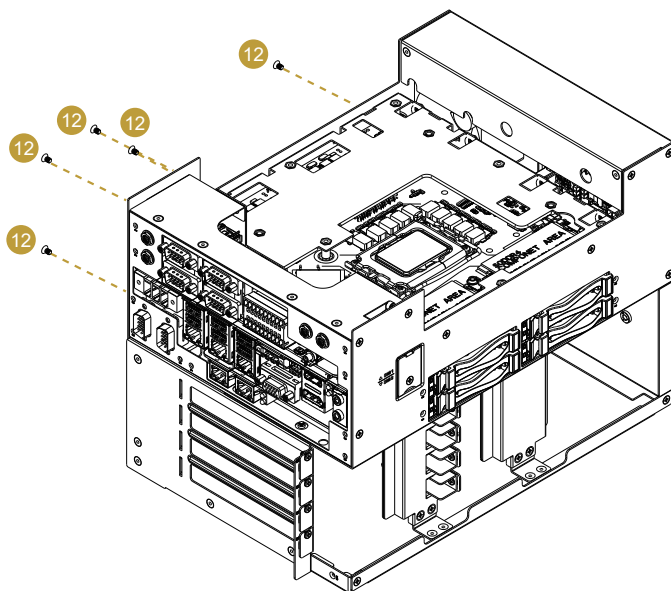
8. Release the screw.
9. Push the cover toward the I/O side of the chassis to remove the cover from the locked position. Remove the cover.



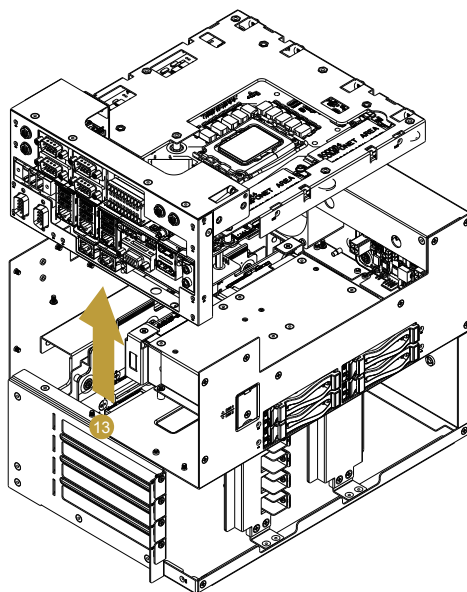
11. Remove the screws from the inside of the chassis.



12. Remove the screws from the rear side of the chassis.

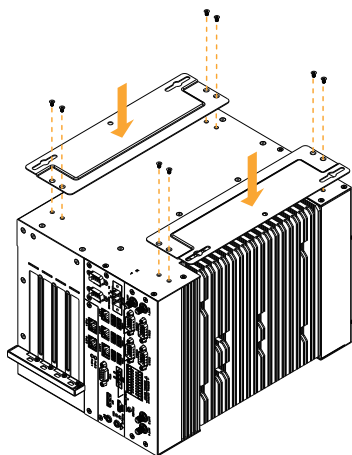


13. Pull out the motherboard tray from the system.

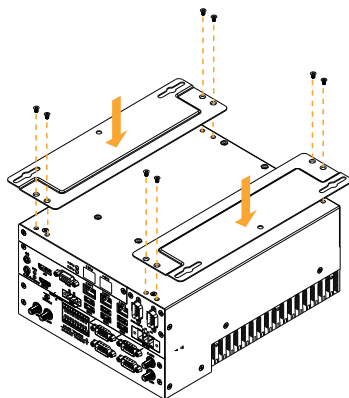


3.4 How to Install the Desk Mount Bracket

1. Attach the two desk mount brackets to the iEPF-9010S Series / iEPF-9020S Series or iEP-9010E Series / iEP-9020E Series and secure them with eight screws.

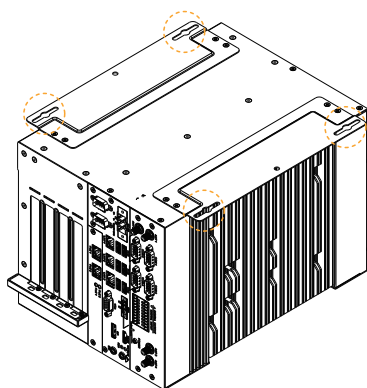


**iEPF-9010S Series
iEPF-9020S Series**

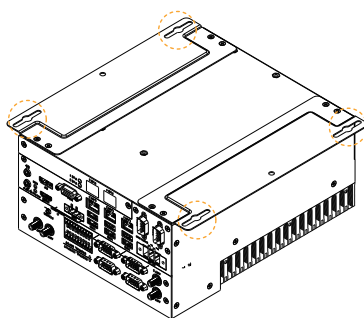


**iEP-9010E Series
iEP-9020E Series**

2. Then you can attach the iEPF-9010S Series / iEPF-9020S Series or iEP-9010E Series / iEP-9020E Series to any horizontal surface.



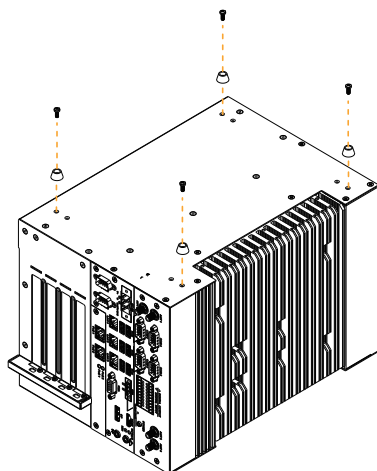
**iEPF-9010S Series
iEPF-9020S Series**



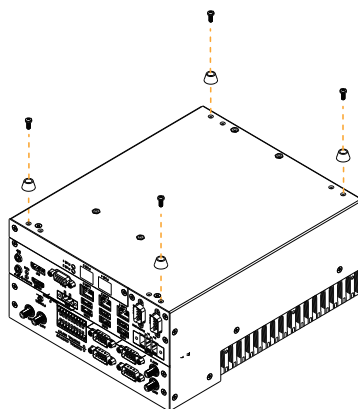
**iEP-9010E Series
iEP-9020E Series**

3.5 How to Install the Rubber Foot

1. Attach four rubber feet to the iEPF-9010S Series / iEPF-9020S Series or iEP-9010E Series / iEP-9020E Series and secure them with four screws.

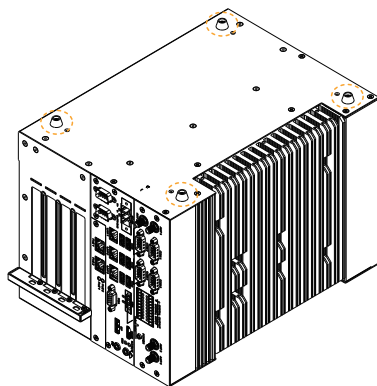


iEPF-9010S Series
iEPF-9020S Series

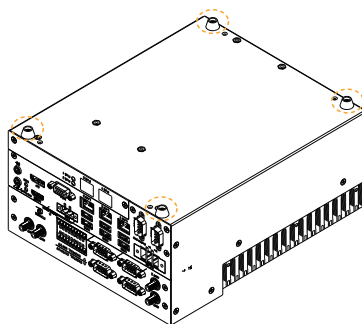


iEP-9010E Series
iEP-9020E Series

2. Then you can put the iEPF-9010S Series / iEPF-9020S Series or iEP-9010E Series / iEP-9020E Series to any horizontal surface.



iEPF-9010S Series
iEPF-9020S Series



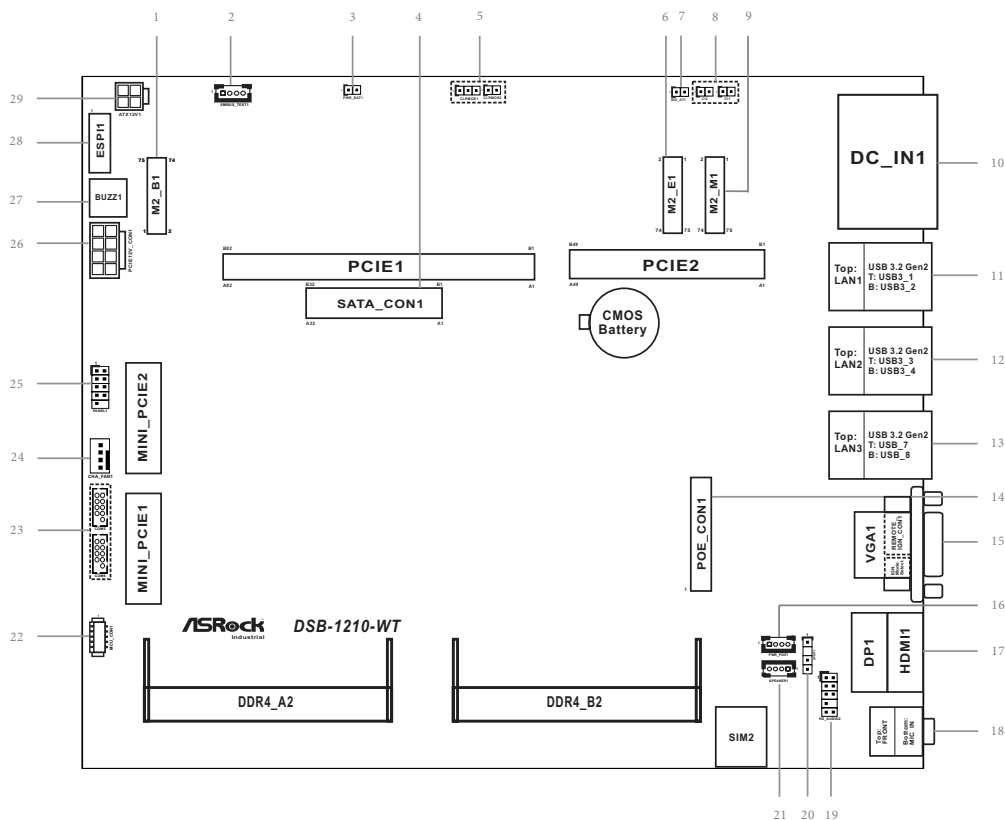
iEP-9010E Series
iEP-9020E Series

Chapter 4 Motherboard

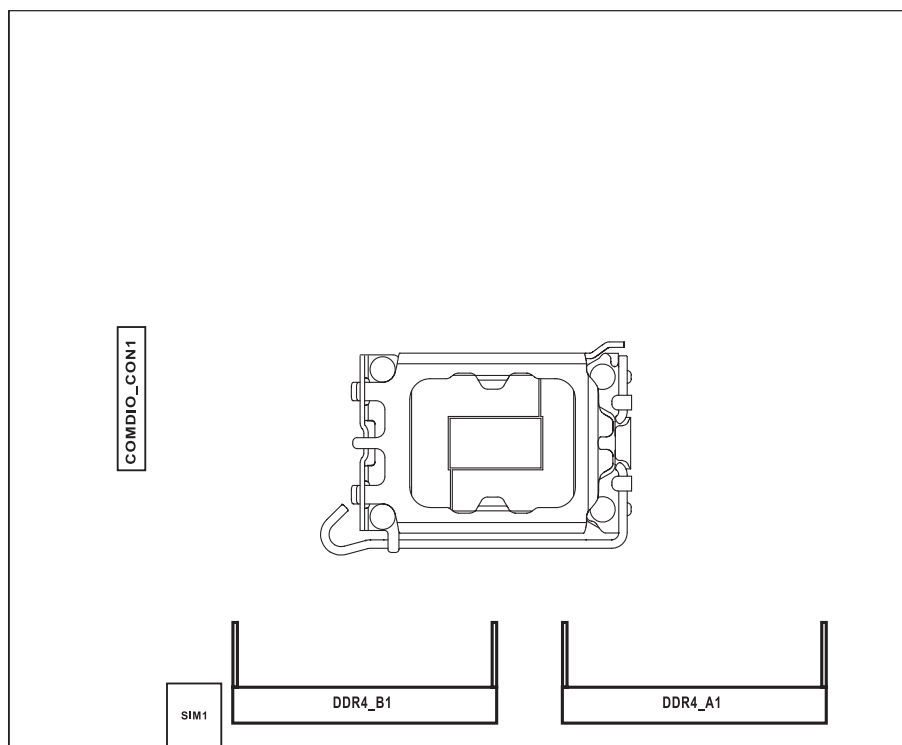
4.1 Motherboard Layout

iEP(F)-9010 Series & iEP(F)-9020 Series

Top Side



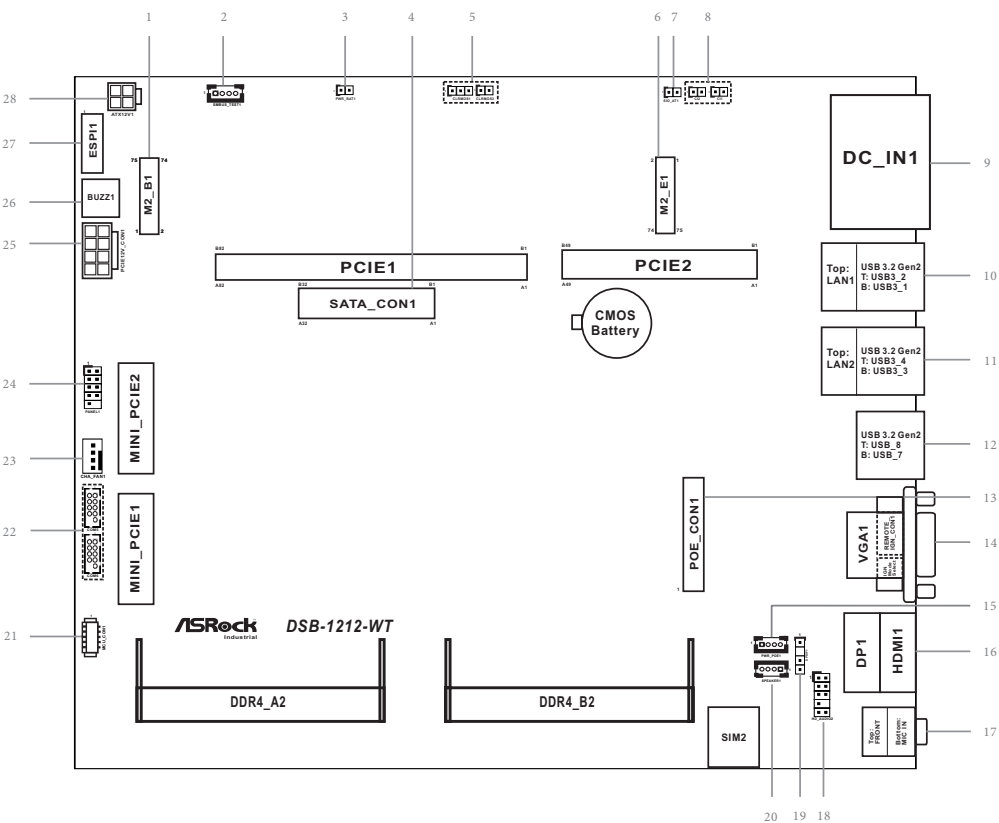
Rear Side



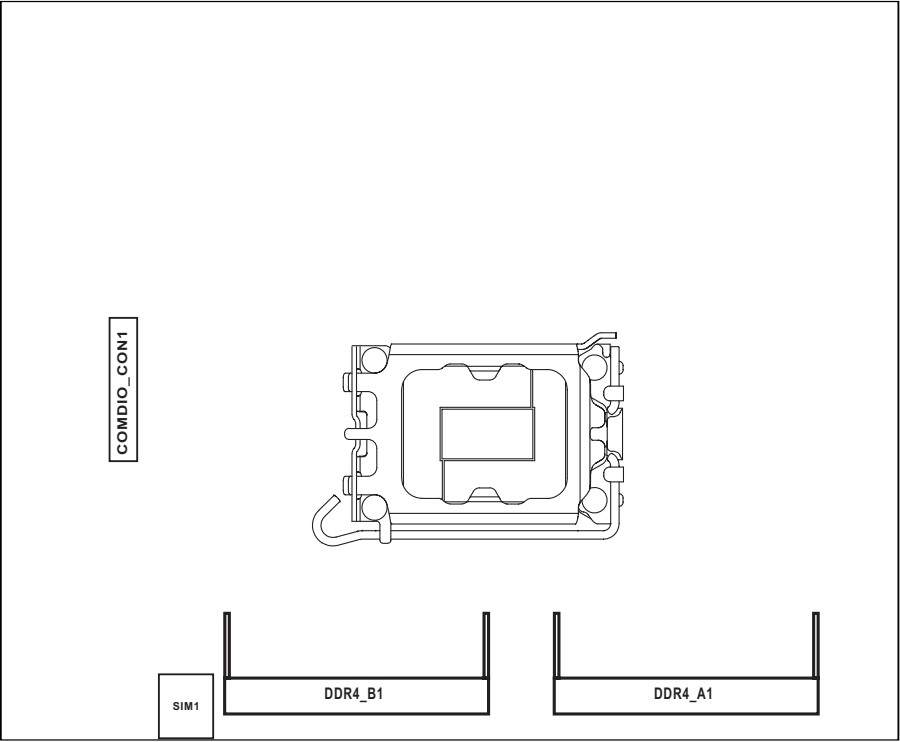
- 1 : M.2 Key-B Socket (M2_B1)
- 2 : SMBUS_TEST1
- 3 : PWR_BAT1
- 4 : SATA Connector (SATA_CON1)
- 5 : Clear CMOS Headers (CLRMOS1, CLRMOS2)
- 6 : M.2 Key-E Socket (M2_E1)
- 7 : ATX/AT Mode Jumper (SIO_AT1)
- 8 : Chassis Intrusion Headers (CI1, CI2)
- 9 : M.2 Key-M Socket (M2_M1)
- 10 : DC Input Connector (DC_IN1)
- 11 : Top : RJ45 LAN Port (LAN1) (Supports vPro)
Bottom : USB3.2 Gen2 Ports (USB3_1_2)
- 12 : Top : RJ45 LAN Port (LAN2)
Bottom : USB3.2 Gen2 Ports (USB3_3_4)
- 13 : Top : RJ45 LAN Port (LAN3)
Bottom : USB3.2 Gen2 Ports (USB_7_8)
- 14 : POE Connector (POE_CON1)
- 15 : Top : D-Sub Port (VGA1)
Bottom Right : REMOTE_IGN_CON1
Bottom Left : IGN Mode Select
- 16 : POE Power Connector (PWR_POE1)
- 17 : Top : DisplayPort (DP1)
Bottom : HDMI Port (HDMI1)
- 18 : Audio Jacks
Top : Green - Line Out
Bottom : Pink - Mic In
- 19 : Front Panel Audio Header (HD_AUDIO2)
- 20 : SPDIF Header (SPDIF1)
- 21 : 3W Audio Output Wafer (SPEAKER1)
- 22 : MCU Connector (MCU_CON1)
- 23 : COM Port Headers (COM5, 6) (RS232/422/485)
- 24 : Chassis FAN Connector (+12V) (CHA_FAN1)
- 25 : System Panel Header (PANEL1)
- 26 : 12V PCIe Power Connector (PCI12V_CON1)
- 27 : Buzz Header (BUZZ1)
- 28 : ESPI Connector (ESPI1)
- 29 : 4-Pin 12V ATX Power Connector (ATX12V1)

iEP(F)-9012 Series & iEP(F)-9022 Series

Top Side



Rear Side



- 1 : M.2 Key-B Socket (M2_B1)
- 2 : SMBUS_TEST1
- 3 : PWR_BAT1
- 4 : SATA Connector (SATA_CON1)
- 5 : Clear CMOS Headers (CLRMOS1, CLRMOS2)
- 6 : M.2 Key-E Socket (M2_E1)
- 7 : ATX/AT Mode Jumper (SIO_AT1)
- 8 : Chassis Intrusion Headers (CI1, CI2)
- 9 : DC Input Connector (DC_IN1)
- 10 : Top : RJ45 LAN Port (LAN1) (Supports vPro)
Bottom : USB3.2 Gen2 Ports (USB3_1_2)
- 11 : Top : RJ45 LAN Port (LAN2)
Bottom : USB3.2 Gen2 Ports (USB3_3_4)
- 12 : USB3.2 Gen2 Ports (USB_7_8)
- 13 : POE Connector (POE_CON1)
- 14 : Top : D-Sub Port (VGA1)
Bottom Right : REMOTE_IGN_CON1
Bottom Left : IGN Mode Select
- 15 : POE Power Connector (PWR_POE1)
- 16 : Top : DisplayPort (DP1)
Bottom : HDMI Port (HDMI1)
- 17 : Audio Jacks
Top : Green - Line Out
Bottom : Pink - Mic In
- 18 : Front Panel Audio Header (HD_AUDIO2)
- 19 : SPDIF Header (SPDIF1)
- 20 : 3W Audio Output Wafer (SPEAKER1)
- 21 : MCU Connector (MCU_CON1)
- 22 : COM Port Headers (COM5, 6) (RS232/422/485)
- 23 : Chassis FAN Connector (+12V) (CHA_FAN1)
- 24 : System Panel Header (PANEL1)
- 25 : 12V PCIe Power Connector (PCIe12V_CON1)
- 26 : Buzz Header (BUZZ1)
- 27 : ESPI Connector (ESPI1)
- 28 : 4-Pin 12V ATX Power Connector (ATX12V1)

4.2 Jumpers Setup

iEP(F)-9010 Series / iEP(F)-9020 Series / iEP(F)-9012 Series / iEP(F)-9022 Series

PWR_BAT1

(2-pin PWR_BAT1)

(see pp. 52, 55, No. 3)



Open : Normal

Short : Charge Battery

Clear CMOS Jumpers

(3-pin CLRMOS1)

(see pp. 52, 55, No. 5)



CLRMOS1 :

1-2 : Normal

2-3 : Clear CMOS

Note: CLRMOS1 allows you to clear the data in CMOS. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord from the power supply. After waiting for 15 seconds, use a jumper cap to short pin2 and pin3 on CLRMOS1 for 5 seconds. However, please do not clear the CMOS right after you update the BIOS. If you need to clear the CMOS when you just finish updating the BIOS, you must boot up the system first, and then shut it down before you do the clear-CMOS action. Please be noted that the date, time and user default profile will be cleared only if the CMOS battery is removed.

(2-pin CLRMOS2)

(see pp. 52, 55, No. 5)



CLRMOS2 :

Open : Normal

Short : Auto Clear CMOS

(Power Off)

Note: CLRMOS2 allows you to clear the data in CMOS automatically when AC power is on. The data in CMOS includes system setup information such as system password, date, time, and system setup parameters. To clear and reset the system parameters to default setup, please turn off the computer and unplug the power cord, and then use a jumper cap to short the pins on CLRMOS2.

ATX/AT Mode Jumper

(2-pin SIO_AT1)

(see pp. 52, 55, No. 7)



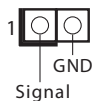
Open : ATX Mode

Short : AT Mode

Chassis Intrusion Headers

(2-pin CI1, CI2)

(see pp. 52, 55, No. 8)



This motherboard supports CASE OPEN detection feature that detects if the chassis cover has been removed. This feature requires a chassis with chassis intrusion detection design.

CI1 :

Short : Active Case Open

Open : Normal

CI2 :

Short : Normal

Open : Active Case Open

4.3 Onboard Headers and Connectors

iEP(F)-9010 Series / iEP(F)-9020 Series / iEP(F)-9012 Series / iEP(F)-9022 Series

SMBUS_TEST1

4-pin SMBUS_TEST1)

(see pp. 52, 55, No. 2)



Pin	Signal Name	Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
1	SMBUS_TEST	2	SMB_CLK	3	SMB_DATA	4	GND

SATA Connector

(SATA_CON1)

(see pp. 52, 55, No. 4)



Pin	Signal Name	Signal Name	Pin
A1	GND	+5V	B1
A2	+5V	+5V	B2
A3	+5V	+5V	B3
A4	GND	GND	B4
A5	RESERVED	SMB_CLK_MAIN	B5
A6	RESERVED	SMB_DATA_MAIN	B6
A7	RESERVED	GND	B7
A8	RESERVED	+3V	B8
A9	+3V	RESERVED	B9
A10	+3V	RESERVED	B10
A11	RESERVED	RESERVED	B11
A12	SATA_SEL1	RESERVED	B12
A13	RESERVED	GND	B13
A14	RESERVED	PCH_SATA2_TXP_C	B14
A15	CFAST_SEL1	PCH_SATA2_TXN_C	B15
A16	PCH_SATA2_RXP_C	GND	B16
A17	PCH_SATA2_RXN_C	RESERVED	B17
A18	GND	GND	B18
A19	SATA_SEL2	PCH_SATA3_TXP_C	B19
A20	GND	PCH_SATA3_TXN_C	B20
A21	PCH_SATA3_RXP_C	GND	B21
A22	PCH_SATA3_RXN_C	GND	B22
A23	GND	PCH_SATA4_TXP_C	B23
A24	GND	PCH_SATA4_TXN_C	B24
A25	PCH_SATA4_RXP_C	GND	B25
A26	PCH_SATA4_RXN_C	GND	B26
A27	GND	PCH_SATA5_TXP_C	B27
A28	GND	PCH_SATA5_TXN_C	B28
A29	PCH_SATA5_RXP_C	GND	B29
A30	PCH_SATA5_RXN_C	RESERVED	B30
A31	GND	RESERVED	B31
A32	RESERVED	GND	B32

POE Connector

(POE_CON1)

(see p. 52, No. 14; p. 55, No. 13)



Pin	Signal Name	Signal Name	Pin
1	BUF_PLT_RST#	GND	26
2	WAKE#	POE1_CLKREQ#	27
3	GND	POE2_CLKREQ#	28
4	GND	GND	29
5	SMB_POE_CLK	POE_SEL0	30
6	SMB_POE_DATA	POE_SEL1	31
7	GND	GND	32
8	GND	RESERVED	33
9	POE1_CLKP_R	RESERVED	34
10	POE1_CLKN_R	RESERVED	35
11	GND	RESERVED	36
12	PCH_POE1_RXP	RESERVED	37
13	PCH_POE1_RXN	RESERVED	38
14	GND	RESERVED	39
15	PCH_POE1_TXP	RESERVED	40
16	PCH_POE1_TXN	RESERVED	41
17	GND	RESERVED	42
18	PCH_POE2_TXP	POE1_DISABLE_N	43
19	PCH_POE2_TXn	POE2_DISABLE_N	44
20	GND	RESERVED	45
21	PCH_POE2_RXP	RESERVED	46
22	PCH_POE2_RXN	RESERVED	47
23	GND	RESERVED	48
24	POE2_CLKP	RESERVED	49
25	POE2_CLKN	RESERVED	50

POE Power Connector

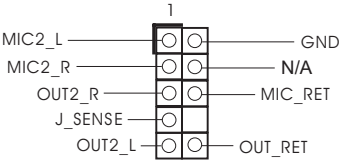
(4-pin PWR_POE1)
(see p. 52, No. 16; p. 55, No. 15)



Pin	Signal Name	Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
1	+12V	2	+12V	3	GND	4	+3VSB

Front Panel Audio Header

(9-pin HD_AUDIO2)
(see p. 52, No. 19; p. 55, No. 18)



SPDIF Header

(3-pin SPDIF1)
(see p. 52, No. 20; p. 55, No. 19)



3W Audio Output Wafer

(4-pin SPEAKER1)
(see p. 52, No. 21; p. 55, No. 20)



Pin	Signal Name	Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
4	OUTRN	3	OUTRP	2	OUTLP	1	OUTLN

MCU Connector

(MCU_CON1)
(see p. 52, No. 22; p. 55, No. 21)



Pin	Signal Name
1	VDD
2	ICE_DAT
3	ICE_CLK
4	RESET#
5	GND

COM Port Headers

(9-pin COM5, 6)
(see p. 52 No. 23; p. 55, No. 22)



Pin	Signal Name	Pin	Signal Name
2	RRXD	1	DDCD#
4	DDTR#	3	TTXD
6	DDSR#	5	GND
8	CCTS#	7	RRTS#
10	N/A	9	N/A



This motherboard supports RS232/422/485 on COM5, 6 ports. Please refer to the table below for the pin definition. In addition, COM5, 6 ports (RS232/422/485) can be adjusted in BIOS setup utility > Advanced Screen > Super IO Configuration. You may refer to our user manual for details.

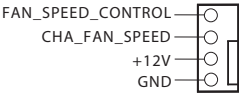
COM5, 6 Ports Pin Definition

Pin	RS232	RS422	RS485
1	DCD	TX-	RTX-
2	RXD	RX+	RTX+
3	TXD	TX+	NA
4	DTR	RX-	N/A
5	GND	GND	GND
6	DSR	N/A	N/A
7	RTS	N/A	N/A
8	CTS	N/A	N/A
9	NA	N/A	N/A

Chassis FAN Connector (+12V)

(4-pin CHA_FAN1)

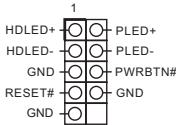
(see p. 52, No. 24; p. 55, No. 23)



System Panel Header

(9-pin PANEL1)

(see p. 52, No. 25; p. 55, No. 24)



Connect the power switch, reset switch and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.

PWRBTN (Power Switch):

Connect to the power switch on the chassis front panel. You may configure the way to turn off your system using the power switch.

RESET (Reset Switch):

Connect to the reset switch on the chassis front panel. Press the reset switch to restart the computer if the computer freezes and fails to perform a normal restart.

PLED (System Power LED):

Connect to the power status indicator on the chassis front panel. The LED is on when the system is operating. The LED keeps blinking when the sys-tem is in S1 sleep state. The LED is off when the system is in S3/S4 sleep state or powered off (S5).

HDLED (Hard Drive Activity LED):

Connect to the hard drive activity LED on the chassis front panel. The LED is on when the hard drive is reading or writing data.

The front panel design may differ by chassis. A front panel module mainly consists of power switch, reset switch, power LED, hard drive activity LED, speaker and etc. When connecting your chassis front panel module to this header, make sure the wire assignments and the pin assign-ments are matched correctly.

12V PCIe Power Connector

(PCIE12V_CON1)

(see p. 52, No. 26; p. 55, No. 25)



Pin	Signal Name	Pin	Signal Name
4	GND	8	GND
3	+12V	7	GND
2	+12V	6	GND
1	+12V	5	GND

Buzzer Header

(2-pin BUZZ1)

(see p. 52, No. 27; p. 55, No. 26)



ESPI Header

(20-pin ESPI1)

(see p. 52, No. 28; p. 55, No. 27)

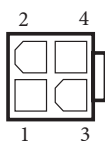


Pin	Signal Name	Signal Name	Pin
1	ESPI_CLK	GND	2
3	ESPI_CS0#	SMB_CLK_MAIN	4
5	ESPI_RESRT#	SMB_DATA_MAIN	6
7	ESPI_IO3	ESPI_IO2	8
9	+3V	ESPI_IO1	10
11	ESPI_IO0	GND	12
		N/A	14
15	+3VSB	ESPI_ALERT#	16
17	GND	GND	18

4-Pin 12V ATX Power Connector

(4-pin ATX12V1)

(see p. 52, No. 29; p. 55, No. 28)



1-2 : GND

3-4 : DC Input

Please connect a DC +12V~28V power supply to this connector.

4.4 Expansion Slots

PCIE1

Pin	Signal Name	Signal Name	Pin
A1	GND	+12V	B1
A2	+12V	+12V	B2
A3	+12V	+12V	B3
A4	X16_CLKREQ#_R	GND	B4
A5	PCH_ECLK_X8	SMB_CLK_MAIN	B5
A6	PCH_ECLK_X8#	SMB_MAIN_MAIN	B6
A7	P-13	GND	B7
A8	P-13	+3V	B8
A9	+3V	RESERVED	B9
A10	+3V	+3VSB	B10
A11	BUF_PLT_RST#	WAKE#	B11
A12	GND	RESERVED	B12
A13	PCH_ECLK_X16_R	GND	B13
A14	PCH_ECLK_X16#_R	PEG_TXP0_R	B14
A15	GND	PEG_TXN0_R	B15
A16	PEG_RXP0	GND	B16
A17	PEG_RXN0	RESERVED	B17
A18	SLOT_SEL0	GND	B18
A19	SLOT_SEL1	PEG_TXP1_R	B19
A20	SLOT_SEL2	PEG_TXN1_R	B20
A21	PEG_RXP1	GND	B21
A22	PEG_RXN1	GND	B22
A23	GND	PEG_TXP2_R	B23
A24	GND	PEG_TXN2_R	B24
A25	PEG_RXP2	GND	B25
A26	PEG_RXN2	GND	B26
A27	GND	PEG_TXP3_R	B27
A28	GND	PEG_TXN3_R	B28
A29	PEG_RXP3	GND	B29
A30	PEG_RXN3	CFG_X8	B30
A31	GND	RESERVED	B31
A32	P-12	GND	B32
A33	P-12	PEG_TXP4_R	B33
A34	GND	PEG_TXN4_R	B34
A35	PEG_RXP4	GND	B35
A36	PEG_RXN4	GND	B36
A37	GND	PEG_TXP5_R	B37
A38	GND	PEG_TXN5_R	B38
A39	PEG_RXP5	GND	B39
A40	PEG_RXN5	GND	B40
A41	GND	PEG_TXP6_R	B41
A42	GND	PEG_TXN6_R	B42
A43	PEG_RXP6	GND	B43
A44	PEG_RXN6	GND	B44
A45	GND	PEG_TXP7_R	B45
A46	GND	PEG_TXN7_R	B46
A47	PEG_RXP7	GND	B47
A48	PEG_RXN7	X8_CLKREQ#	B48
A49	GND	GND	B49
A50	USB2_13_14_EN1	PEG_TXP8_R	B50
A51	GND	PEG_TXN8_R	B51
A52	PEG_RXP8	GND	B52
A53	PEG_RXN8	GND	B53
A54	GND	PEG_TXP9_R	B54
A55	GND	PEG_TXN9_R	B55
A56	PEG_RXP9	GND	B56
A57	PEG_RXN9	GND	B57
A58	GND	PEG_TXP10_R	B58
A59	GND	PEG_TXN10_R	B59
A60	PEG_RXP10	GND	B60
A61	PEG_RXN10	GND	B61
A62	GND	PEG_TXP11_R	B62
A63	GND	PEG_TXN11_R	B63
A64	PEG_RXP11	GND	B64
A65	PEG_RXN11	GND	B65
A66	GND	PEG_TXP12_R	B66
A67	GND	PEG_TXN12_R	B67
A68	PEG_RXP12	GND	B68
A69	PEG_RXN12	GND	B69
A70	GND	PEG_TXP13_R	B70
A71	GND	PEG_TXN13_R	B71
A72	PEG_RXP13	GND	B72
A73	PEG_RXN13	GND	B73
A74	GND	PEG_TXP14_R	B74
A75	GND	PEG_TXN14_R	B75
A76	PEG_RXP14	GND	B76
A77	PEG_RXN14	GND	B77
A78	GND	PEG_TXP15_R	B78
A79	GND	PEG_TXN15_R	B79
A80	PEG_RXP15	GND	B80
A81	PEG_RXN15	+3VSB	B81
A82	GND	+3VSB	B82

PCIE2

Pin	Signal Name	Signal Name	Pin
A1	GND	+12V	B1
A2	+12V	+12V	B2
A3	+12V	+12V	B3
A4	GND	GND	B4
A5	PCH_ECLK_X4_2	SMB_CLK_MAIN	B5
A6	PCH_ECLK_X4_2#	SMB_DATA_MAIN	B6
A7	RESERVED	GND	B7
A8	RESERVED	+3V	B8
A9	+3V	SIO_PMEM#	B9
A10	+3V	+3VSB	B10
A11	BUF_PLT_RST#	WAKE#	B11
A12	GND	RESERVED	B12
A13	PCH_ECLK_X4_1	GND	B13
A14	PCH_ECLK_X4_1#	PCH_PE_TXP1_C	B14
A15	GND	PCH_PE_TXP2_C	B15
A16	PCH_PE_RXP1	GND	B16
A17	PCH_PE_RXN1	RESERVED	B17
A18	GND	GND	B18
A19	RESERVED	PCH_PE_TXP2_C	B19
A20	GND	PCH_PE_TXN2_C	B20
A21	PCH_PE_RXP2	GND	B21
A22	PCH_PE_RXN2	GND	B22
A23	GND	PCH_PE_TXP3_C	B23
A24	GND	PCH_PE_TXN3_C	B24
A25	PCH_PE_RXP3	GND	B25
A26	PCH_PE_RXN3	GND	B26
A27	GND	PCH_PE_TXP4_C	B27
A28	GND	PCH_PE_TXN4_C	B28
A29	PCH_PE_RXP4	GND	B29
A30	PCH_PE_RXN4	RESERVED	B30
A31	GND	X4_PRESENT#_1	B31
A32	RESERVED	GND	B32
A33	RESERVED	PCIE_4_TXP21_C	B33
A34	GND	PCIE_4_TXN21_C	B34
A35	PCIE_4_RXP21	GND	B35
A36	PCIE_4_RXN21	GND	B36
A37	GND	PCIE_4_TXP22_C	B37
A38	GND	PCIE_4_TXN22_C	B38
A39	PCIE_4_RXP22	GND	B39
A40	PCIE_4_RXN22	GND	B40
A41	GND	PCIE_4_TXP23_C	B41
A42	GND	PCIE_4_TXN23_C	B42
A43	PCIE_4_RXP23	GND	B43
A44	PCIE_4_RXN23	GND	B44
A45	GND	PCIE_4_TXP24_C	B45
A46	GND	PCIE_4_TXN24_C	B46
A47	PCIE_4_RXP24	GND	B47
A48	PCIE_4_RXN24	X4_PRESENT#_2	B48
A49	GND	GND	B49

M.2 Key-B Socket (M.2_B1)

Pin	Signal Name	Signal Name	Pin
75	NA	+3.3V	74
73	GND	+3.3V	72
71	GND	+3.3V	70
69	NA	NA	68
67	NA	NA	66
65	NA	NA	64
63	NA	NA	62
61	NA	NA	60
59	NA	NA	58
57	GND	NA	56
55	PEFCLKp	WAKE#	54
53	PEFCLKn	CLKREQ#	52
51	GND	PERST#	50
49	PETp0	NA	48
47	PETn0	NA	46
45	GND	NA	44
43	PERp0	NA	42
41	PERn0	NA	40
39	GND	NA	38
37	USB3_TX+	UIM_PWR	36
35	USB3_TX-	UIM_DATA	34
33	GND	UIM_CLK	32
31	USB3_RX+	UIM_RESET	30
29	USB3_RX-	NA	28
27	GND	NA	26
25	NA	NA	24
23	NA	NA	22
21	GND	NA	20
11	GND		
9	USB_D-	WWAN_LED#	10
7	USB_D+	W_DISABLE	8
5	GND	FuLL_Card_Power_off	6
3	GND	+3.3V	4
1	NA	+3.3V	2

M.2 Key-E Socket (M.2_E1)

Pin	Signal Name	Signal Name	Pin
2	+3VSB	GND	1
4	+3VSB	USB_D+	3
6	NA	USB_D-	5
8	NA	GND	7
10	CNV_RF_RESET	CNV_WGR_D1-	9
12	NA	CNV_WGR_D1+	11
14	MODEM_CLKREQ	GND	13
16	NA	CNV_WGR_D0-	15
18	GND	CNV_WGR_D0+	17
20	NA	GND	19
22	CNV_BRI_RSP	CNV_WGR_CLK-	21
		CNV_WGR_CLK+	23
32	CNV_BGL_DT	GND	33
34	CNV_BGL_RSP	PETp	35
36	CNV_BRI_DT	PETn	37
38	NA	GND	39
40	NA	PERp	41
42	NA	PERn	43
44	NA	GND	45
46	NA	PEFCLKp	47
48	NA	PEFCLKn	49
50	SUSCLK	GND	51
52	PERST0#	CLKREQ#	53
54	W_DISABLE#	WAKE#	55
56	W_DISABLE#	GND	57
58	SMB_DATA	CNV_WT_D1-	59
60	SMB_CLK	CNV_WT_D1+	61
62	NA	GND	63
64	CLKIN_XTAL_LCP	CNV_WT_D0-	65
66	NA	CNV_WT_D0+	67
68	NA	GND	69
70	NA	CNV_WT_CLK-	71
72	+3VSB	CNV_WT_CLK+	73
74	+3VSB	GND	75

M.2 Key-M Socket (M.2_M1)

(For iEP(F)-9010 Series & iEP(F)-9020 Series Only)

Pin	Signal Name	Signal Name	Pin
2	+3.3V	GND	1
4	+3.3V	GND	3
6	NA	PERn3	5
8	NA	PERp3	7
10	SATA_LED	GND	9
12	+3.3V	PETn3	11
14	+3.3V	PETp3	13
16	+3.3V	GND	15
18	+3.3V	PERn2	17
20	NA	PERp2	19
22	NA	GND	21
24	NA	PETn2	23
26	NA	PETp2	25
28	NA	GND	27
30	NA	PERn1	29
32	NA	PERp1	31
34	NA	GND	33
36	NA	PETn1	35
38	DEVSLP	PETp1	37
40	SMB_CLK	GND	39
42	SMB_DATA	PERn0	41
44	NA	PERp0	43
46	NA	GND	45
48	NA	PETn0	47
50	PERST#	PETp0	49
52	CLKREQ#	GND	51
54	WAKE#	PEFCLKn	53
56	NA	PEFCLKp	55
58	NA	GND	57
68	NA	NA	67
70	+3.3V	PEDET	69
72	+3.3V	GND	71
74	+3.3V	GND	73
	GND		75

Chapter 5 UEFI Setup Utility

5.1 Introduction

ASRock Industrial UEFI (Unified Extensible Firmware Interface) is a BIOS utility which offers tweak-friendly options in an advanced viewing interface. The UEFI system works with a USB mouse and offers users a faster, sleeker experience.

This BIOS utility can perform the Power-On Self-Test (POST) during system startup, record hardware parameters of the system, load operating system, and so on. The battery on the motherboard supplies the power needed to the CMOS when the system power is turned off, and the values configured in the UEFI utility are kept in the CMOS.

Please note that inadequate BIOS settings may cause system instability, malfunction or boot failure. We strongly recommend that you do not alter the UEFI default configurations or change the settings only with the assistance of a trained service person.

If the system becomes unstable or fails to boot after you change the setting, try to clear the CMOS values and reset the board to default values. See your motherboard manual for instructions.

5.1.1 Entering BIOS Setup

You may run the UEFI SETUP UTILITY by pressing <F2> or <Delete> right after you power on the computer; otherwise, the Power-On-Self-Test (POST) will continue with its test routines. If you wish to enter the UEFI SETUP UTILITY after POST, restart the system by pressing <Ctl> + <Alt> + <Delete>, or by pressing the reset button on the system chassis. You may also restart by turning the system off and then back on.

This setup guide explains how to use the UEFI SETUP UTILITY to configure all the supported system. The screenshots in this manual are for reference only. UEFI Settings and options may vary owing to different BIOS release versions or CPU installed. Please refer to the actual BIOS version of the motherboard you purchased for detailed screens, settings and options.

5.1.2 UEFI Menu Bar

The top of the screen has a menu bar with the following selections:

Main	For setting system time/date information
Advanced	For advanced system configurations
H/W Monitor	Displays current hardware status
Security	For security settings
Boot	For configuring boot settings and boot priority
Exit	Exit the current screen or the UEFI Setup Utility



Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions for reference purpose only, and may vary from the latest BIOS and do not exactly match what you see on your screen.

5.1.3 Navigation Keys

Use <←> key or <→> key to choose among the selections on the menu bar, and use <↑> key or <↓> key to move the cursor up or down to select items, then press <Enter> to get into the sub screen. You can also use the mouse to click your required item.

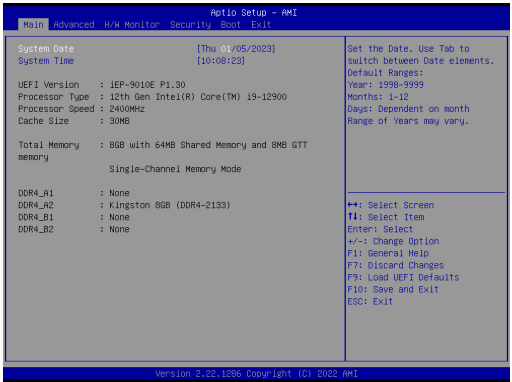
Please check the following table for the descriptions of each navigation key.

Navigation Key(s)	Description
+ / -	To change option for the selected items
<Tab>	Switch to next function
<PGUP>	Go to the previous page
<PGDN>	Go to the next page
<HOME>	Go to the top of the screen
<END>	Go to the bottom of the screen
<F1>	To display the General Help Screen
<F7>	Discard changes and exit the SETUP UTILITY
<F9>	Load optimal default values for all the settings
<F10>	Save changes and exit the SETUP UTILITY
<F12>	Print screen
<ESC>	Jump to the Exit Screen or exit the current screen

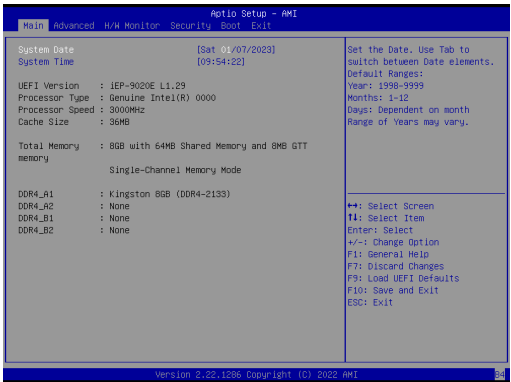
5.2 Main Screen

When you enter the UEFI SETUP UTILITY, the Main screen will appear and display the system overview.

iEP-9010E



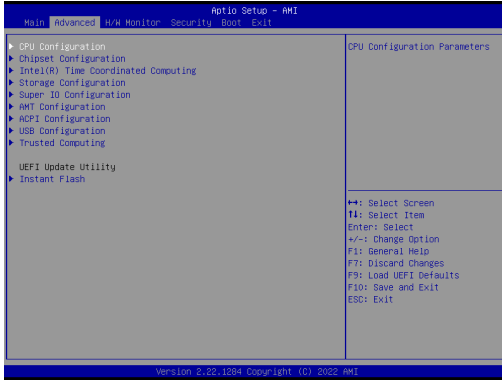
iEP-9020E



Because the UEFI software is constantly being updated, the following UEFI setup screens and descriptions are for reference purpose only, and they may not exactly match what you see on your screen. Options may also vary depending on the features of your motherboard.

5.3 Advanced Screen

In this section, you may set the configurations for the following items: CPU Configuration, Chipset Configuration, Intel(R) Time Coordinated Computing, Storage Configuration, Super IO Configuration, ACPI Configuration, USB Configuration and Trusted Computing.

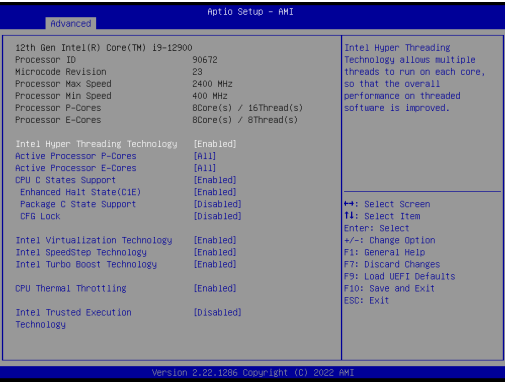


Setting wrong values in this section may cause the system to malfunction.

Instant Flash

Instant Flash is a UEFI flash utility embedded in Flash ROM. This convenient UEFI update tool allows you to update system UEFI without entering operating systems first like MS-DOS or Windows®. Just launch this tool and save the new UEFI file to your USB flash drive, floppy disk or hard drive, and then you can update your UEFI in only a few clicks without preparing an additional floppy diskette or other complicated flash utility. Please be noted that the USB flash drive or hard drive must use FAT32/16/12 file system. If you execute Instant Flash utility, the utility will show the UEFI files and their respective information. Select the proper UEFI file to update your UEFI, and reboot your system after UEFI update process completes.

5.3.1 CPU Configuration



Intel Hyper Threading Technology

Intel Hyper Threading Technology allows multiple threads to run on each core, so that the overall performance on threaded software is improved.

Configuration options: [Enabled] [Disabled]

Active Processor P-Cores

This allows you to select the number of cores to enable in each processor package.

Active Processor E-Cores

This allows you to select the number of E-Cores to enable in each processor package.

NOTE: Number of P-Cores and E-Cores are looked at together. When both are {0,0}, Pcode will enable all cores.

CPU C States Support

This allows you to enable CPU C States Support for power saving. It is recommended to keep C3, C6 and C7 all enabled for better power saving.

Configuration options: [Enabled] [Disabled]

Intel Virtualization Technology

Intel Virtualization Technology allows a platform to run multiple operating systems and applications in independent partitions, so that one computer system can function as multiple virtual systems.

Configuration options: [Enabled] [Disabled]

Intel SpeedStep Technology

Intel SpeedStep technology allows processors to switch between multiple frequencies and voltage points for better power saving and heat dissipation. CPU turbo ratio can be fixed when Intel SpeedStep Technology is set to [Disabled] and Intel Turbo Boost Technology is set to [Enabled].

Configuration options: [Enabled] [Disabled].

If you install Windows® 10 and want to enable this function, please set this item to [Enabled]. This item will be hidden if the current CPU does not support Intel SpeedStep technology.



Please note that enabling this function may reduce CPU voltage and lead to system stability or compatibility issues with some power supplies. Please set this item to [Disabled] if above issues occur.

Intel Turbo Boost Technology

Intel Turbo Boost Technology enables the processor to run above its base operating frequency when the operating system requests the highest performance state. The default value is [Enabled].

Configuration options: [Enabled] [Disabled]

CPU Thermal Throttling

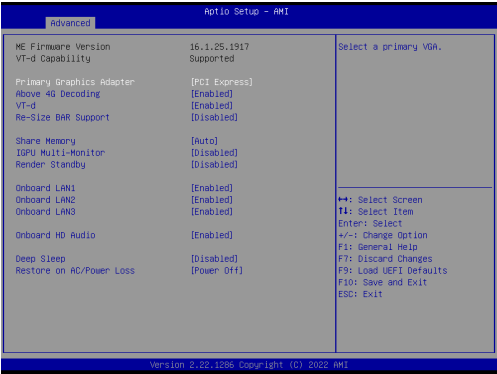
CPU Thermal Throttling allows you to enable CPU internal thermal control mechanisms to keep the CPU from overheating.

Configuration options: [Enabled] [Disabled]

Intel Trusted Execution Technology

The item enables utilization of additional hardware capabilities provided by Intel (R) Trusted Execution Technology. Changes require a full power cycle to take effect.

5.3.2 Chipset Configuration



Primary Graphics Adapter

The option allows you to select a primary VGA.

Configuration options: [Onboard] [PCI Express] (Options vary when you have installed a graphics card on your motherboard.)

Above 4G Decoding

The option allows you to enable or disable above 4G Memory Mapped IO decoding. This is disabled automatically when Aperture Size is set to 2048MB.

Configuration options: [Enabled] [Disabled]

VT-d

Intel® Virtualization Technology for Directed I/O helps your virtual machine monitor better utilize hardware by improving application compatibility and reliability, and providing additional levels of manageability, security, isolation, and I/O performance.

Configuration options: [Enabled] [Disabled]

Re-Size BAR Support

If system has Resizable BAR capable PCIe Devices, this option enables or disables Resizable BAR Support.

Share Memory

Share memory allows you to configure the size of memory that is allocated to the integrated graphics processor when the system boots up.

Configuration options: [Auto] [32M] [64M] [128M] [256M] [512M]

Options vary depending on the memory you use on your motherboard.

IGPU Multi-Monitor

Select [Disabled] to disable the integrated graphics when an external graphics card is installed. Select [Enabled] to keep the integrated graphics enabled at all times.

Configuration options: [Enabled] [Disabled]

Render Standby

Power down the render unit when the GPU is idle for lower power consumption.

Onboard LAN1

This allows you to enable or disable the Onboard LAN1 feature.

Onboard LAN2

This allows you to enable or disable the Onboard LAN2 feature.

Onboard LAN3

This allows you to enable or disable the Onboard LAN3 feature.

5.3.3 Intel(R) Time Coordinated Computing



#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 two cache lines.

#GP Split 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.

IFU Enable

Enable or Disable Instruction Fetch Unit(IFU). When enabled, Instructions will be prefetch to the cache.

Software SRAM

Enable or Disable Software SRAM. Enable will allocate 1 way of LLC; if Cache Configuration subregion is available, it will allocate based on the subregion.

Data Streams Optimizer

Enable or Disable Data Streams Optimizer (DSO). Enable will utilize DSO Subregion to tune system. DSO settings supercede Intel(R) TCC Mode settings that overlap between the two.

Error Log

Enable or Disable Error Log. Enable will record errors related to Intel(R) TCC and save them to memory.

Intel(R) TCC Authentication Menu

Press Enter to configure 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 performance. The full list of settings and their current state are displayed below when Intel(R) TCC mode is enabled.

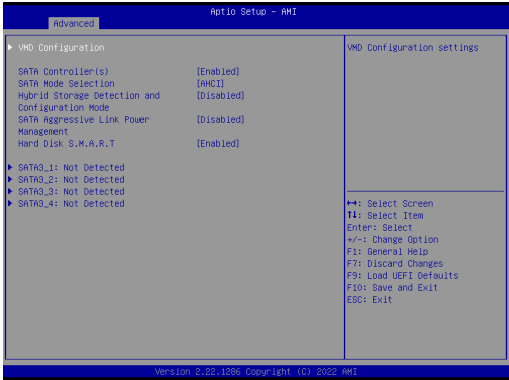
IO Fabric Low Latency

Enable or Disable IO Fabric Low Latency. This will turn off some power management in the PCH IO fabrics. This option provides the most aggressive IO Fabric performance setting. S3 state is NOT supported.

GT CLOS

Enable or Disable Graphics Technology(GT) Class of Service. Enable will reduce Gfx LLC allocation to minimize impact of Gfx workload on LLC.

5.3.4 Storage Configuration



SATA Controller(s)

The option allows you to enable or disable the SATA controllers.

Configuration options: [Enabled] [Disabled]

SATA Mode Selection

AHCI supports new features that improve performance.

Configuration option: [AHCI]



AHCI (Advanced Host Controller Interface) supports NCQ and other new features that will improve SATA disk performance but IDE mode does not have these advantages.

Hybrid Storage Detection and Configuration Mode

The option allows you to select Hybrid Storage Detection and Configuration Mode.

Configuration options: [Dynamic Configuration for Hybrid Storage Enable]
[Disabled]

SATA Aggressive Link Power Management

SATA Aggressive Link Power Management allows SATA devices to enter a low power state during periods of inactivity to save power. It is supported only by AHCI mode.

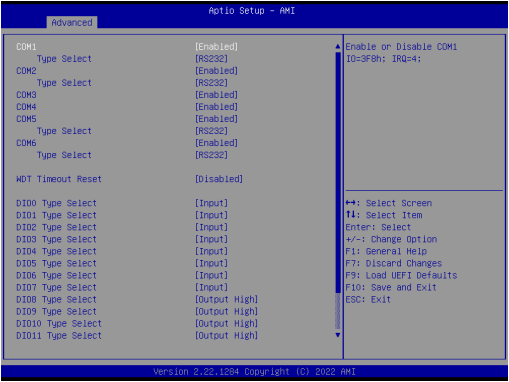
Configuration options: [Enabled] [Disabled]

Hard Disk S.M.A.R.T.

S.M.A.R.T stands for Self-Monitoring, Analysis, and Reporting Technology. It is a monitoring system for computer hard disk drives to detect and report on various indicators of reliability.

Configuration options: [Enabled] [Disabled]

5.3.5 Super IO Configuration



COM1 Configuration

Use this to set parameters of COM1.

Type Select

Use this to select COM1 port type: [RS232], [RS422] or [RS485].

COM2 Configuration

Use this to set parameters of COM2.

Type Select

Use this to select COM2 port type: [RS232], [RS422] or [RS485].

COM3 Configuration

Use this to set parameters of COM3.

COM4 Configuration

Use this to set parameters of COM4.

COM5 Configuration

Use this to set parameters of COM5.

Type Select

Use this to select COM5 port type: [RS232], [RS422] or [RS485].

COM6 Configuration

Use this to set parameters of COM6.

Type Select

Use this to select COM6 port type: [RS232], [RS422] or [RS485].

WDT Timeout Reset

Use this to set the Watch Dog Timer.

DID0 Type Select

Use this to set DIO Type: [Input].

DID1 Type Select

Use this to set DIO Type: [Input].

DID2 Type Select

Use this to set DIO Type: [Input].

DID3 Type Select

Use this to set DIO Type: [Input].

DID4 Type Select

Use this to set DIO Type: [Input].

DID5 Type Select

Use this to set DIO Type: [Input].

DID6 Type Select

Use this to set DIO Type: [Input].

DID7 Type Select

Use this to set DIO Type: [Input].

DID8 Type Select

Use this to set DIO Type: [Output Low] or [Output High].

DID9 Type Select

Use this to set DIO Type: [Output Low] or [Output High].

DID10 Type Select

Use this to set DIO Type: [Output Low] or [Output High].

DID11 Type Select

Use this to set DIO Type: [Output Low] or [Output High].

DID12 Type Select

Use this to set DIO Type: [Output Low] or [Output High].

DID13 Type Select

Use this to set DIO Type: [Output Low] or [Output High].

DID14 Type Select

Use this to set DIO Type: [Output Low] or [Output High].

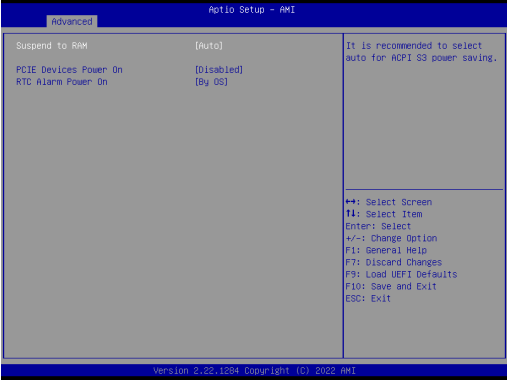
DID15 Type Select

Use this to set DIO Type: [Output Low] or [Output High].

Pin Location and Corresponding Signal

DIO	Function
DIO0	SIO GPIO70
DIO1	SIO GPIO71
DIO2	SIO GPIO72
DIO3	SIO GPIO73
DIO4	SIO GPIO74
DIO5	SIO GPIO75
DIO6	SIO GPIO76
DIO7	SIO GPIO77
DIO8	SIO GPIO80
DIO9	SIO GPIO81
DIO10	SIO GPIO82
DIO11	SIO GPIO83
DIO12	SIO GPIO84
DIO13	SIO GPIO85
DIO14	SIO GPIO86
DIO15	SIO GPIO87

5.3.6 ACPI Configuration



Suspend to RAM

Suspend to RAM allows you to select [Disabled] for ACPI suspend type S1. It is recommended to select [Auto] for ACPI S3 power saving.

Configuration options: [Auto] [Disabled]

PCIE Devices Power On

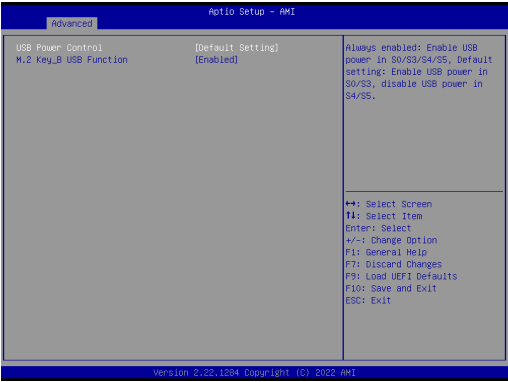
Use this item to enable or disable PCIE devices to turn on the system from the power-soft-off mode.

RTC Alarm Power On

RTC Alarm Power On allows the system to be waked up by the real time clock alarm. Set it to By OS to let it be handled by your operating system.

Configuration options: [Enabled] [Disabled] [By OS]

5.3.7 USB Configuration



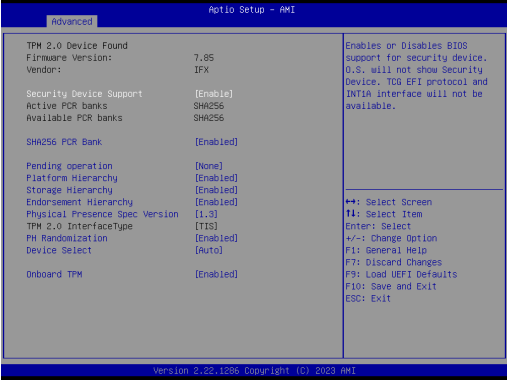
USB Power Control

Use this option to control USB power.

M.2 Key_B Function

The item enables or disables M.2 Key_B USB function.

5.3.8 Trusted Computing



Security Device Support

Security Device Support allows you to enable or disable BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

Configuration options: [Enabled] [Disabled]

SHA256 PCR Bank

SHA256 PCR Bank allows you to enable or disable SHA256 PCR Bank.

Configuration options: [Enabled] [Disabled]

Pending Operation

Pending Operation allows you to schedule an Operation for the Security Device.

NOTE: Your computer will reboot during restart in order to change State of the Device.

Configuration options: [None] [TPM Clear]

Platform Hierarchy

This item allows you to enable or disable Platform Hierarchy.

Configuration options: [Enabled] [Disabled]

Storage Hierarchy

This item allows you to enable or disable Storage Hierarchy.

Configuration options: [Enabled] [Disabled]

Endorsement Hierarchy

This item allows you to enable or disable Endorsement Hierarchy.

Configuration options: [Enabled] [Disabled]

Physical Presence Spec Version

Select this item to tell OS to support PPI spec version 1.2 or 1.3. Please note that some HCK tests might not support version 1.3.

Configuration options: [1.2] [1.3]

TPM 2.0 InterfaceType

This item allows you to view the Communication Interface to TPM 2.0 Device: CRB or ITS.

PH Randomization

The item enables or disables Platform Hierarchy randomization.

Device Select

This item allows you to select the TPM device to be supported.

[TPM 1.2] restricts support to TPM 1.2 devices.

[TPM 2.0] restricts support to TPM 2.0 devices.

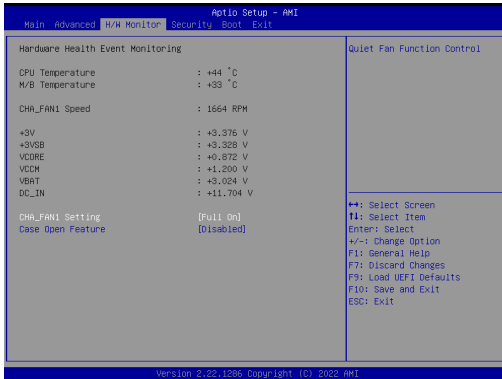
[Auto] supports both TPM 1.2 and TPM 2.0 devices with the default set to TPM 2.0 devices. If TPM 2.0 devices are not found, TPM 1.2 devices will be enumerated.

Onboard TPM

The option enables or disables Intel PTT in ME. Disable this option to use discrete TPM Module.

5.4 Hardware Health Event Monitoring Screen

This section allows you to monitor the status of the hardware on your system, including the parameters of the CPU temperature, motherboard temperature, CPU fan speed, chassis fan speed, and the critical voltage.



CHA_Fan 1 Setting

This allows you to set chassis fan 1's speed. The default value is [Full On]. Select a fan mode for Chassis Fan 1, or choose Customize to set 5 CPU temperatures and assign a respective fan speed for each temperature.

Configuration options: [Full On] [Automatic Mode]

Case Open Feature

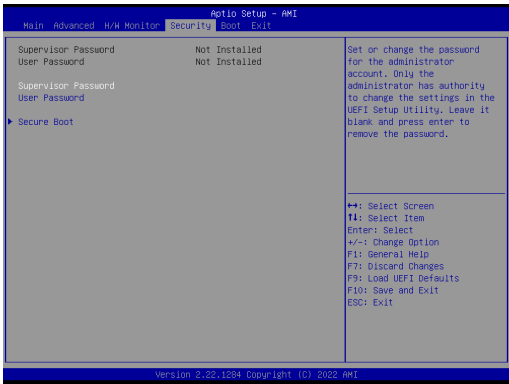
This item allows you to enable or disable case open detection feature. The default is value [Disabled].

Clear Status

This option appears only when the case open has been detected. Use this option to keep or clear the record of previous chassis intrusion status.

5.5 Security Screen

In this section, you may set, change or clear the supervisor/user password for the system.



Supervisor Password

Set or change the password for the administrator account. Only the administrator has the authority to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

User Password

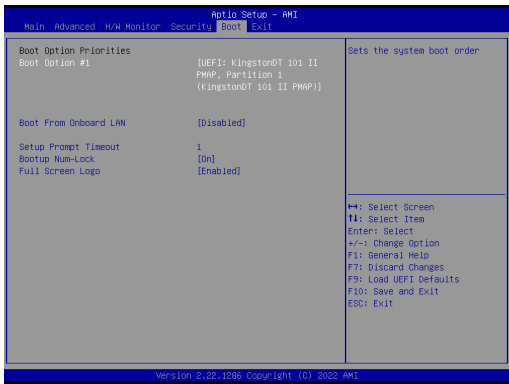
Set or change the password for the user account. Users are unable to change the settings in the UEFI Setup Utility. Leave it blank and press enter to remove the password.

Secure Boot

Press [Enter] to configure the Secure Boot Settings. The feature protects the system from unauthorized access and malwares during POST.

5.6 Boot Screen

This section displays the available devices on your system for you to configure the boot settings and the boot priority.



Boot Option #1

The item allows you to set the system boot order.

Boot From Onboard LAN

The item allows the system to be waked up by the onboard LAN.

Configuration options: [Enabled] [Disabled]

Setup Prompt Timeout

The item allows you to configure the number of seconds to wait for the UEFI setup utility. 65535(0xFFFF) means indefinite waiting.

Configuration options: [1] - [65535]

Bootup Num-Lock

The item allows you to select whether Num Lock should be turned on or off when the system boots up.

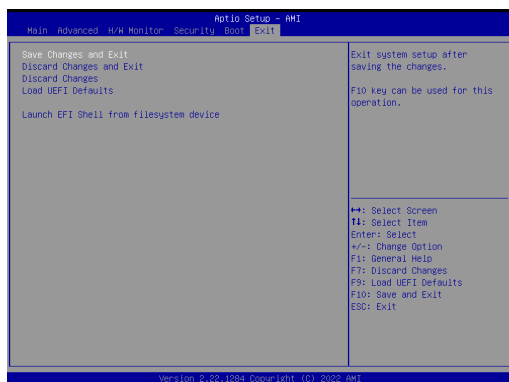
Configuration options: [On] [Off]

Full Screen Logo

[Enabled] Select this item to display the boot logo.

[Disabled] Select this item to show normal POST messages.

5.7 Exit Screen



Save Changes and Exit

When you select this option, the following message “Save configuration changes and exit setup?” will pop out. Select [Yes] to save the changes and exit the UEFI SETUP UTILITY.

Discard Changes and Exit

When you select this option, the following message “Discard changes and exit setup?” will pop out. Select [Yes] to exit the UEFI SETUP UTILITY without saving any changes.

Discard Changes

When you select this option, the following message “Discard changes?” will pop out. Select [Yes] to discard all the changes.

Load UEFI Defaults

The item allows you to load UEFI default values for all options. The F9 key can be used for this operation.

Launch EFI Shell from filesystem device

The item allows you to copy shellx64.efi to the root directory to launch EFI Shell.