NEXCOM International Co., Ltd.

Intelligent Platform & Services Business Unit

Wide Screen Touch Computer

XPPC 16-201

User Manual

NEXCOM International Co., Ltd.
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www.nexcom.com

Contents

Appendix A: Power Consumption

PREFACE

Copyright

Disclaimer

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Acknowledgements

XPPC 16-201 is a trademark of NEXCOM International Co., Ltd. All other product names mentioned herein are registered trademarks of their respective owners.

Regulatory Compliance Statements

This section provides the FCC compliance statement for Class A devices and
describes how to keep the system CE compliant.

Declaration of Conformity

FCC

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

CE

The product(s) described in this manual complies with all applicable European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

RoHS Compliance

NEXCOM RoHS Environmental Policy and Status Update

RoHS restricts the use of Lead (Pb) < 0.1% or 1,000ppm, Mercury (Hg) < 0.1% or 1,000ppm, Cadmium (Cd) < 0.01% or 100ppm, Hexavalent Chromium (Cr6+) < 0.1% or 1,000ppm, Polybrominated biphenyls (PBB) < 0.1% or 1,000ppm, and Polybrominated diphenyl Ethers (PBDE) < 0.1% or 1,000ppm.

In order to meet the RoHS compliant directives, NEXCOM has established an engineering and manufacturing task force to implement the introduction of green products. The task force will ensure that we follow the standard NEXCOM development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which NEXCOM are renowned.

The model selection criteria will be based on market demand. Vendors and suppliers will ensure that all designed components will be RoHS compliant.

How to recognize NEXCOM RoHS Products?

For existing products where there are non-RoHS and RoHS versions, the suffix "(LF)" will be added to the compliant product name.

All new product models launched after January 2006 will be RoHS compliant. They will use the usual NEXCOM naming convention.

Warranty and RMA

NEXCOM Warranty Period

NEXCOM manufactures products that are new or equivalent to new in accordance with industry standard. NEXCOM warrants that products will be free from defect in material and workmanship for 2 years, beginning on the date of invoice by NEXCOM.

NEXCOM Return Merchandise Authorization (RMA)

- Customers shall enclose the "NEXCOM RMA Service Form" with the returned packages.
- Customers must collect all the information about the problems encountered and note anything abnormal or, print out any on-screen messages, and describe the problems on the "NEXCOM RMA Service Form" for the RMA number apply process.
- Customers can send back the faulty products with or without accessories (manuals, cable, etc.) and any components from the card, such as CPU and RAM. If the components were suspected as part of the problems, please note clearly which components are included. Otherwise, NEXCOM is not responsible for the devices/parts.
- Customers are responsible for the safe packaging of defective products, making sure it is durable enough to be resistant against further damage and deterioration during transportation. In case of damages occurred during transportation, the repair is treated as "Out of Warranty."
- Any products returned by NEXCOM to other locations besides the customers' site will bear an extra charge and will be billed to the customer.

Repair Service Charges for Out-of-Warranty Products

NEXCOM will charge for out-of-warranty products in two categories, one is basic diagnostic fee and another is component (product) fee.

System Level

- Component fee: NEXCOM will only charge for main components such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistor, capacitor.
- Items will be replaced with NEXCOM products if the original one cannot be repaired. Ex: motherboard, power supply, etc.
- Replace with 3rd party products if needed.
- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Board Level

- Component fee: NEXCOM will only charge for main components, such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistors, capacitors.
- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Warnings

Read and adhere to all warnings, cautions, and notices in this guide and the documentation supplied with the chassis, power supply, and accessory modules. If the instructions for the chassis and power supply are inconsistent with these instructions or the instructions for accessory modules, contact the supplier to find out how you can ensure that your computer meets safety and regulatory requirements.

Cautions

- Electrostatic discharge (ESD) can damage system components. Do the described procedures only at an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the computer chassis.
- Proper grounding is essential to protect against electrical surges and ensure stable operation. Always connect the grounding wire.

Safety Information

Before installing and using the device, note the following precautions:

- Read all instructions carefully.
- Do not place the unit on an unstable surface, cart, or stand.
- Follow all warnings and cautions in this manual.
- When replacing parts, ensure that your service technician uses parts specified by the manufacturer.
- Avoid using the system near water, in direct sunlight, or near a heating device.
- The load of the system unit does not solely rely for support from the rackmounts located on the sides. Firm support from the bottom is highly necessary in order to provide balance stability.
- The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Installation Recommendations

Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:

- A Philips screwdriver
- A flat-tipped screwdriver
- A grounding strap
- An anti-static pad

Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nose pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

Safety Precautions

1. Read these safety instructions carefully.

2. Keep this User Manual for later reference.

3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.

4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.

5. Keep this equipment away from humidity.

6. Put this equipment on a stable surface during installation. Dropping it or letting it fall may cause damage.

7. The openings on the enclosure are for air convection to protect the equipment from overheating. DO NOT COVER THE OPENINGS.

8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.

9. Place the power cord in a way so that people will not step on it. Do not place anything on top of the power cord. Use a power cord that has been approved for use with the product and that it matches the voltage and current marked on the product's electrical range label. The voltage and current rating of the cord must be greater than the voltage and current rating marked on the product.

10. All cautions and warnings on the equipment should be noted.

11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.

12. Never pour any liquid into an opening. This may cause fire or electrical shock.

13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.

14. If one of the following situations arises, get the equipment checked by service personnel:
    a. The power cord or plug is damaged.
    b. Liquid has penetrated into the equipment.
    c. The equipment has been exposed to moisture.
    d. The equipment does not work well, or you cannot get it to work according to the user's manual.
    e. The equipment has been dropped and damaged.
    f. The equipment has obvious signs of breakage.

15. Do not place heavy objects on the equipment.

16. The unit uses a three-wire ground cable which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace your obsolete outlet.

17. **ATTENTION:** Risque d'explosion si la batterie est remplacée par un type
    incorrect. Mettre au rebus les batteries usagées selon les instructions.

    CAUTION: Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

Technical Support and Assistance

1. For the most updated information of NEXCOM products, visit NEXCOM's website at www.nexcom.com.

2. For technical issues that require contacting our technical support team or sales representative, please have the following information ready before calling:
   - Product name and serial number
   - Detailed information of the peripheral devices
   - Detailed information of the installed software (operating system, version, application software, etc.)
   - A complete description of the problem
   - The exact wordings of the error messages

Warning!

1. Handling the unit: carry the unit with both hands and handle it with care.

2. Maintenance: to keep the unit clean, use only approved cleaning products or clean with a dry cloth.

3. CompactFlash: Turn off the unit's power before inserting or removing a CompactFlash storage card.

Conventions Used in this Manual

Warning:
Information about certain situations, which if not observed, can cause personal injury. This will prevent injury to yourself when performing a task.

Caution:
Information to avoid damaging components or losing data.

Note:
Provides additional information to complete a task easily.

Global Service Contact Information

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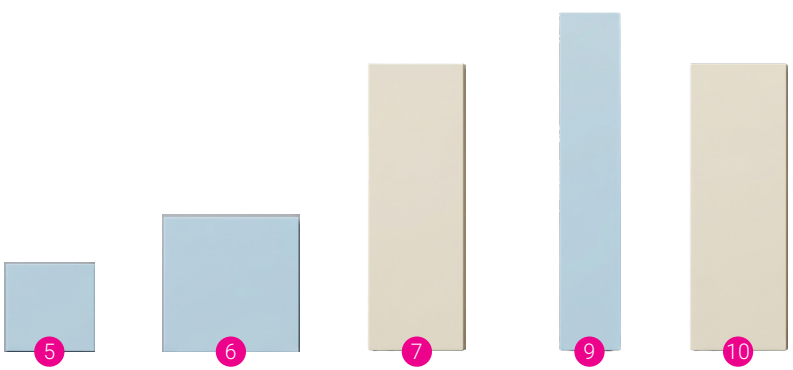
Package Contents

Before continuing, please verify the contents of the product package. The included items are listed in the table and illustrated in the images below; note that the images are for reference only and may be subject to change.

Item	Part Number	Name	Qty
1	10W30XPPC53X0	XPPC16-201-125U	1
2	7400096009X00	POWER ADAPTER FSP:FSP096-AHAN3(9NA0961442)	1
3	50311F0144X00	I HEAD SCREW LONG FEI: M3x4mm NI NYLOK	3
4	5040430536X00	M.2 EXTEND NUT BRACKET FOR 5G/LTE Module	1
5	5060200510X00	Thermal pad: 20x20x2mm for WiFi module	1
6	5060200376X00	Thermal pad: 28x28x2mm for LTE module	1
7	5060200706X00	Thermal pad: 60x20x2mm for SSD and RAM	2
8	5050900091X00	Memory cover	1
9	5060200954X00	Thermal pad: 70x13x1.5mm for Memory cover	1
10	5060200720X00	Thermal pad: 60x20x3.0mm between DIMM1 and PCB	1
11	50311F0365X00	Screws for securing memory cover	2



Ordering Information

The following provides ordering information.

- **Barebone:**
  XPPC16-201-125U (P/N: 10W30XPPC53X0)
  15. 6” FHD LED multi-touchscreen computer, Intel® Core™ Ultra 5 processor 125U, w/ optical bonding

- **Panel mount kit (P/N: 88W30XPPC04X0)**
- **Open frame kit (P/N: 88W30XPPC12X0)**

Chapter 1: Product Introduction

Overview

Key Features

- 15.6” TFT FHD 16:9 panel
- 10-point PCAP multi-touch with slim bezel design
- IP65 protection on the front
- Support VESA/panel/open frame mounting type
- Intel® Core™ Ultra processor (Series 1)
- 2 x DDR5 SO-DIMM, up to 96GB
- 1 x M.2 Key B 3042/3052 for an optional 5G/LTE module
- 1 x M.2 Key E 2230 for an optional Wi-Fi module
- 1 x M.2 Key M 2280 for an optional SSD
- Support DC 12V power input

Hardware Specifications

Panel

- LCD size: 15.6”, 16:9
- Resolution: 1920x1080 (FHD)
- Luminance
  - LCD panel: industrial grade 450cd/m2
  - XPPC PCAP touch: 90% of panel’s luminance after optical bonding
- Contrast ratio: 1000:1
- LCD color: 16.7M
- Viewing angle: 89 (U), 89 (D), 89 (L), 89 (R)
- Touchscreen
  - 10-point PCAP (projected capacitive touch)
  - Optical bonding
  - Glass surface treatment: AF

Processor

- Intel® Core™ Ultra processor (Series 1)

Integrated Graphics

- Intel® UHD Graphics

System Capabilities

- TPM 2.0

Memory

- 2 x DDR5 SO-DIMM, non-ECC, up to 96GB Storage

Storage

- 1 x M.2 Key M 2280 SSD (PCIe 4.0 x4, SATA 3.0)

Expansion Slot

- 1 x M.2 Key B 3042/3052
  - Support a 5G/LTE module (PCIe 4.0 x1, USB 3.2, USB 2.0)
- 1 x M.2 Key E 2230
  - Support a Wi-Fi module (PCIe 4.0 x1, USB 2.0)

I/O Interface Rear

- 1 x DC 12V power input
- 1 x 1GbE RJ45 port, Intel® I219-LM
- 1 x 2.5GbE RJ45 port, Intel® I226-V
- 2 x HDMI® 2.0, up to 3840x2160@60Hz
- 1 x USB 3.2 Gen 1x1, Type-A
- 3 x USB 2.0, Type-A
- 1 x COM port, supports RS-232/422/485
- 1 x Line out
- 1 x Power button

I/O Interface Front

- 2 x Antenna hole

I/O Interface Internal

- 2 x 6-pin header for 4 x USB 2.0 port
- 1 x 10-pin header for 4-in & 4-out GPIO
- 1 x 9-pin header for RS-232 (COM2)
- 1 x 3-pin jumper for LCD panel voltage 3.3V/5V setting
- 1 x DC Power thru one 2-pin pitch=3.96mm ATX connector (lockable)

Mechanical

- Dimensions: 382.2mm (W) x 251.4mm (D) x 51.8mm (H)
- Net weight: 2.84kg
- Mounting type:
  - VESA Mount 100mm x 100mm
  - Panel Mount (optional kit)
  - Open Frame (optional kit)

Package Information

- Dimensions: 481mm (W) x 361mm (D) x 220mm (H)
- Gross weight: 4.5kg (1 unit per carton)

Environment

- Temperature:
  - Ambient with air flow: 0°C~50°C
  - Storage temperature: -20°C~80°C
- Relative humidity: 0%~90% (non-condensing)
- Shock protection: 20g peak acceleration, 11ms according to IEC 60068-2-27
- Vibration protection
  - Random: 2.2Grms@5~500Hz, 0.5hr/axis (non-operating), IEC 60068-2-64
  - Sinusoidal: 2Grms@5~500Hz, 1hr/axis, IEC 60068-2-6

Power Supply

- DC 12V power input
  - 1 x 12V, 96W AC/DC lockable adapter included in accessory

Certification

- CE (EN55035 + EN55032)
- FCC Class A (EMI part 15B)
- LVD (EN62368-1)Certifications
- CE (EMC EN 55035 + EN 55032)
- FCC Class A (EMI Part 15B)
- LVD (EN 62368-1)

Operating System

- Windows 11
- Windows 10, 64-bit
- Linux

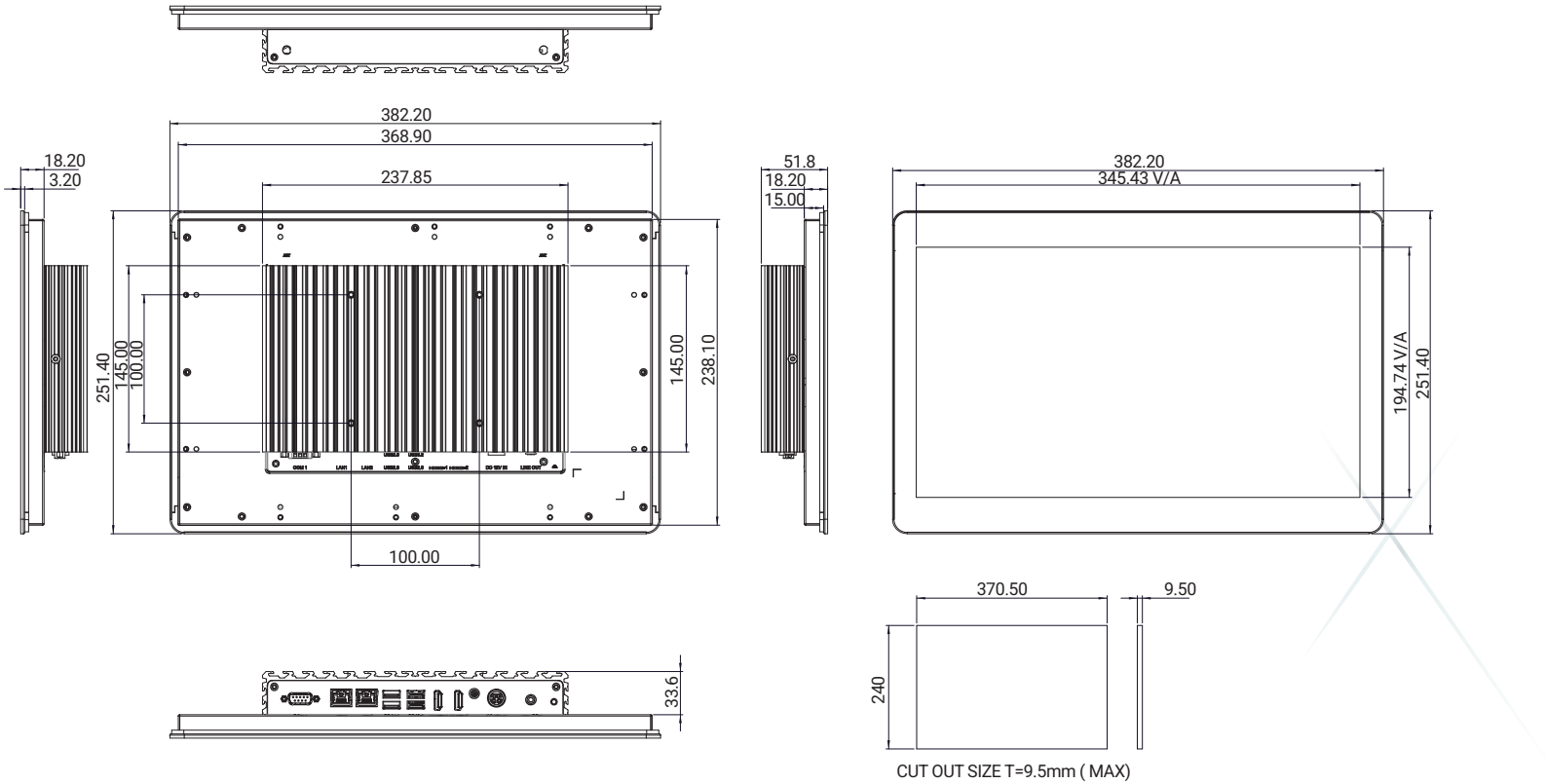
Knowing Your XPPC 16-201

Rear Top

Rear Bottom

1. Antenna holes
2. COM port (RS-232/422/485)
3. 1GbE RJ45 LAN port (Intel® I219-LM)
4. 2.5GbE RJ45 LAN port (Intel® I226-V)
5. USB 2.0 Type-A
6. USB 3.2 Gen 1x1, Type-A
7. HDMI® 2.0, up to 3842x2160@60Hz
8. Power button
9. DC 12V power input
10. Line out jack

Mechanical Dimensions



Chapter 2: Jumpers and Connectors

This chapter describes how to set the jumpers and connectors on the XPPC 16-201 motherboard.

Before You Begin

- Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.
- Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:
  - A Philips screwdriver
  - A flat-tipped screwdriver
  - A set of jewelers screwdrivers
  - A grounding strap
  - An anti-static pad
- Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nosed pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.
- Before working on internal components, make sure that the power is off. Ground yourself before touching any internal components, by touching a metal object. Static electricity can damage many of the electronic components. Humid environments tend to have less static electricity than dry environments. A grounding strap is warranted whenever danger of static electricity exists.

Precautions

Computer components and electronic circuit boards can be damaged by discharges of static electricity. Working on computers that are still connected to a power supply can be extremely dangerous.

Follow the guidelines below to avoid damage to your computer or yourself:

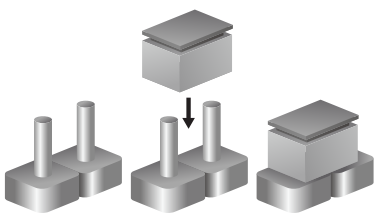
- Always disconnect the unit from the power outlet whenever you are working inside the case.
- If possible, wear a grounded wrist strap when you are working inside the computer case. Alternatively, discharge any static electricity by touching the bare metal chassis of the unit case, or the bare metal body of any other grounded appliance.
- Hold electronic circuit boards by the edges only. Do not touch the components on the board unless it is necessary to do so. Don't flex or stress the circuit board.
- Leave all components inside the static-proof packaging that they shipped with until they are ready for installation.
- Use correct screws and do not over tighten screws.

Jumper Settings

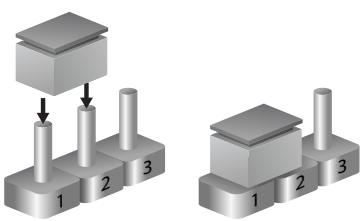
A jumper is the simplest kind of electric switch. It consists of two metal pins and a cap. When setting the jumpers, ensure that the jumper caps are placed on the correct pins. When the jumper cap is placed on both pins, the jumper is short. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is open.

Refer to the illustrations below for examples of what the 2-pin and 3-pin jumpers look like when they are short (on) and open (off).

Two-Pin Jumpers: Open (Left) and Short (Right)



Three-Pin Jumpers: Pins 1 and 2 are Short

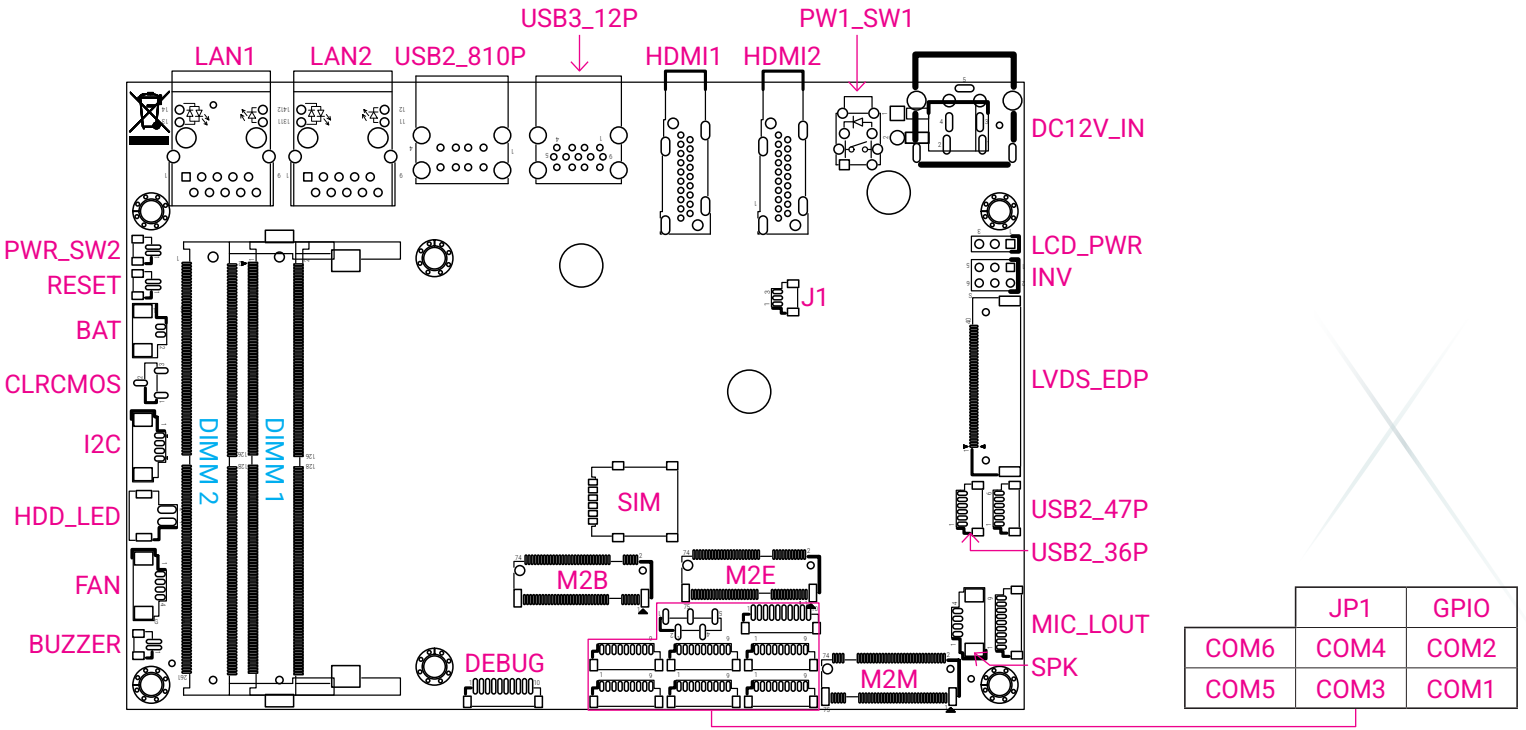


System Motherboard Overview

This chapter outlines the location and pin assignments of jumpers and connectors, with reference illustrations (not to scale) and pink-marked pin definitions to aid understanding.

Location of Jumpers and Connectors on the Motherboard

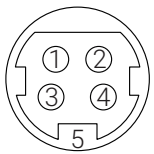
Top View



External I/O Interfaces

DC Power Input

Connector location: DC12V_IN

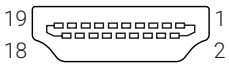


Pin	Definition
1	+12V
2	+12V
3	GND
4	GND
5	CHASSIS

HDMI®

Connector type: HDMI®

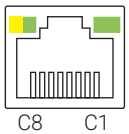
Connector location: HDMI1, HDMI2



Pin	Definition	Pin	Definition
1	TX2P	2	GND
3	TX2N	4	TX1P
5	GND	6	TX1N
7	TX0P	8	GND
9	TX0N	10	CLK_P
11	GND	12	CLK_N
13	NC	14	NC
15	SCL	16	SDA
17	GND	18	+5V
19	HPD		
MH1	CGND	MH2	CGND
MH3	CGND	MH4	CGND
NH1	N.C.	NH2	N.C.

LAN

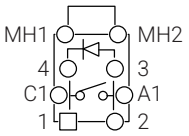
Connector type: RJ45 port with LEDs
Connector location: LAN1 (I219-LM), LAN2 (I226-V)



Pin	Definition
C1	MDI_TX1+
C2	MDI_TX1-
C3	MDI_TX2+
C6	MDI_TX2-
C4	MDI_TX3+
C5	MDI_TX3-
C7	MDI_TX4+
C8	MDI_TX4-

System Power Button 1

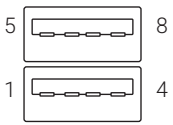
Connector location: PWR_SW1



Pin	Definition
1	SWITCH_NODE1
2	SWITCH_NODE2
3	SWITCH_NODE3
4	SWITCH_NODE4
C1	LED-
A1	LED+
MH1	N.C.
MH2	N.C.

Dual USB 2.0

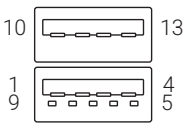
Connector type: USB Type-A
Connector location: USB2_810P



Pin	Definition	Pin	Definition
1	+5V	2	USB2_D1-
3	USB2_D1+	4	GND
5	+5V	6	USB2_D2-
7	USB2_D2+	8	GND
MH1	CGND	MH2	CGND
MH3	CGND	MH4	CGND

USB 3.2 + USB 2.0

Connector type: USB Type-A
Connector location: USB3_12P



Pin	Definition	Pin	Definition
1	+5V	2	USB2_D0-
3	USB2_D0+	4	GND
5	USB3_RX-	6	USB3_RX+
7	GND	8	USB3_TX-
9	USB3_TX+	10	+5V
11	USB2_D1-	12	USB2_D1+
13	GND		
MH1	CGND	MH2	CGND
MH3	CGND	MH4	CGND

Internal I/O Interfaces

RTC Battery Connector

Connector location: BAT

Pin	Definition
1	GND
2	+VBAT

Buzzer

Connector location: BUZZER

Pin	Definition
1	BUZZER-
2	BUZZER+

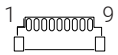
Clear CMOS

Connector location: CLRCMOS

Pin	Definition
1-2 On	Normal (default)
2-3 On	Clear CMOS

COM Ports

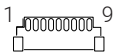
Connector location: COM1, COM2



Pin	RS-232	RS-422	RS-485
1	RI#		
2	CTS#		
3	RTS#		
4	DSR#		
5	GND		
6	DTR#	RX-	
7	TXD#	RX+	
8	RXD#	TX+	D+
9	DCD#	TX-	D-

COM Ports

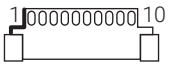
Connector location: COM3, COM4, COM5, COM6



Pin	Definition
1	RI#
2	CTS#
3	RTS#
4	DSR#
5	GND
6	DTR#
7	TXD#
8	RXD#
9	DCD#

Port 80 (Debug Only)

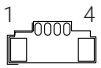
Connector location: DEBUG



Pin	Definition
1	GND
2	PLTRST#
3	ESPI_CLK
4	ESPI_CS#
5	ESPI_IO3
6	ESPI_IO2
7	ESPI_IO1
8	ESPI_IO0
9	ESPI_RST#
10	+3.3VSB

CPU Fan

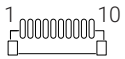
Connector location: FAN



Pin	Definition
1	GND
2	+12V
3	FAN SPEED DETECT
4	FAN SPEED CONTROL

GPIO

Connector location: GPIO



Pin	Definition
1	+5V
2	GND
3	GPO0
4	GPO1
5	GPO2
6	GPO3
7	GPI0
8	GPI1
9	GPI2
10	GPI3

Storage Status LED

Connector location: HDD_LED

Pin	Definition
1	LED+
2	LED-

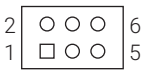
I2C

Connector location: I2C

Pin	Definition
1	GND
2	I2C_DAT
3	I2C_CLK
4	+5V

LVDS Panel Inverter

Connector location: INV



Pin	Definition
1	GND
2	GND
3	+12V
4	+12V
5	BKLTEN
6	BKLCTRL

Firmware Upgrade (Debug Only)

Connector location: J1

Pin	Settings
1	SMB_SCL
2	SMB_DAT
3	GND

COM2 Voltage Select

Connector location: JP1

Pin	Settings
1-2 On	COM2 RI Pin is Ring (default)
2-3 On	COM2 RI pin is +5V
4-5 On	COM2 RI pin is +12V

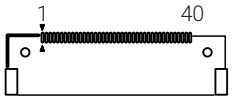
Panel Power Select

Connector location: LCD_PWR

Pin	Settings
1-2 On	Panel Power is +3.3V (default)
2-3 On	Panel Power is +5V

LVDS/eDP Panel

Connector location: LVDS_EDP



Pin	LVDS Definition	eDP Definition
1	LVDS0_DAT3+	N.C.
2	LVDS0_DAT3-	N.C.
3	LVDS0_DAT2+	EDP_TX0+
4	LVDS0_DAT2-	EDP_TX0-
5	LVDS0_DAT1+	EDP_TX1+
6	LVDS0_DAT1-	EDP_TX1-
7	LVDS0_DAT0+	EDP_HPD
8	LVDS0_DAT0-	N.C.
9	LVDS1_DAT3+	N.C.
10	LVDS1_DAT3-	N.C.
11	LVDS1_DAT2+	N.C.
12	LVDS1_DAT2-	N.C.
13	LVDS1_DAT1+	N.C.
14	LVDS1_DAT1-	N.C.
15	LVDS1_DAT0+	N.C.
16	LVDS1_DAT0-	N.C.
17	GND	GND
18	+V_PANEL (Jumper select +3.3V or +5V)	+V_PANEL (Jumper select +3.3V or +5V)
19	+V_PANEL (Jumper select +3.3V or +5V)	+V_PANEL (Jumper select +3.3V or +5V)
20	+V_PANEL (Jumper select +3.3V or +5V)	+V_PANEL (Jumper select +3.3V or +5V)

Pin	LVDS Definition	eDP Definition
21	GND	GND
22	+V_PANEL (Jumper select +3.3V or +5V)	+V_PANEL (Jumper select +3.3V or +5V)
23	GND	GND
24	GND	GND
25	GND	GND
26	LVDS0_CLK+	EDP_AUX+
27	LVDS0_CLK-	EDP_AUX-
28	GND	GND
29	GND	GND
30	GND	GND
31	N.C.	N.C.
32	BKLTEN	BKLTEN
33	BKLTCTRL	BKLTCTRL
34	LVDS1_CLK+	N.C.
35	LVDS1_CLK-	N.C.
36	+V_INV (+12V)	+V_INV (+12V)
37	+V_INV (+12V)	+V_INV (+12V)
38	+V_INV (+12V)	+V_INV (+12V)
39	+V_INV (+12V)	+V_INV (+12V)
40	N.C.	GND (Must connect to panel GND)

M.2 Key B

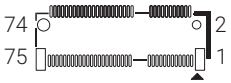
Connector form factor: 3042/3052
Connector interface: PCIe x1, USB 3.2, USB 2.0
Connector location: M2B

Pin	Definition	Pin	Definition
1	CONFIG3	2	3.3V
3	GND	4	3.3V
5	GND	6	POWER_OFF#
7	USB2_P	8	W_DISABLE1#
9	USB2_N	10	LED#
11	GND		
Key			
21	CONFIG0	22	NC
23	NC	24	NC
25	NC	26	W_DISABLE2#
27	GND	28	NC
29	USB3_RXN	30	UIM_RESET
31	USB3_RXP	32	UIM_CLK
33	GND	34	UIM_DATA
35	USB3_TXN	36	UIM_PWR
37	USB3_TXP	38	NC
39	GND	40	NC
41	PCIE_RXN	42	NC

Pin	Definition	Pin	Definition
43	PCIE_RXP	44	NC
45	GND	46	NC
47	PCIE_TXN	48	NC
49	PCIE_TXP	50	PCIE_RST# (3.3V)
51	GND	52	PCIE_CLKREQ#
53	REFCLKN	54	PCIE_WAKE#
55	REFCLKP	56	NC
57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	NC
67	LTE_RST# (1.8V)	68	SUS_CLK
69	CONFIG1	70	3.3V
71	GND	72	3.3V
73	GND	74	3.3V
75	CONFIG2		

M.2 Key E

Connector form factor: 2230
Connector interface: PCIe x1, USB 2.0
Connector location: M2E

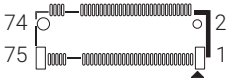


Pin	Definition	Pin	Definition
1	GND	2	3.3V_1
3	USB_D+	4	3.3V_2
5	USB_D-	6	LED1#
7	GND2	8	PCM_CLK
9	SDIO_CLK	10	PCM_SYNC
11	SDIO_CMD	12	PCM_IN
13	SDIO_DATA0	14	PCM_OUT
15	SDIO_DATA1	16	LED2#
17	SDIO_DATA2	18	GND3
19	SDIO_DATA3	20	UART_WAKE#
21	SDIO_WAKE#	22	UART_RXD
23	SDIO_RESET#		
Key			
33	GND4	34	UART_CTS
35	PETP0	36	UART_RTS
37	PETN0	38	RESERVED_1
39	GND5	40	RESERVED_2
41	PERP0	42	RESERVED_3

Pin	Definition	Pin	Definition
43	PERN0	44	COEX3
45	GND6	46	COEX2
47	REFCLKP0	48	COEX1
49	REFCLKN0	50	SUSCLK
51	GND7	52	PERST0#
53	CLKREQ0#	54	W_DISABLE2#
55	PEWAKE0#	56	W_DISABLE1#
57	GND8	58	I2C_DATA
59	PETP1	60	I2C_CLK
61	PETN1	62	ALERT#
63	GND9	64	RESERVED
65	PERP1	66	UIM_SWP
67	PERN1	68	UIM_POWER_SNK
69	GND10	70	UIM_POWER_SRC
71	PEFCLKP1	72	3.3V_3
73	PEFCLKN1	74	3.3V_4
75	GND11		

M.2 Key M

Connector form factor: 2280
Connector interface: PCIe x4, SATA
Connector location: M2M

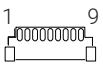


Pin	Definition	Pin	Definition
1	GND	2	VCC3
3	GND	4	VCC3
5	PCIE_RX3N	6	NC
7	PCIE_RX3P	8	NC
9	GND	10	LED#
11	PCIE_TX3N	12	VCC3
13	PCIE_TX3P	14	VCC3
15	GND	16	VCC3
17	PCIE_RX2N	18	VCC3
19	PCIE_RX2P	20	NC
21	GND	22	NC
23	PCIE_TX2N	24	NC
25	PCIE_TX2P	26	NC
27	GND	28	NC
29	PCIE_RX1N	30	NC
31	PCIE_RX1P	32	NC
33	GND	34	NC
35	PCIE_TX1N	36	NC

Pin	Definition	Pin	Definition
37	PCIE_TX1P	38	DEVSLP
39	GND	40	NC
41	SATA_RXP (PCIE_RX0P)	42	NC
43	SATA_RXN (PCIE_RX0N)	44	NC
45	GND	46	NC
47	SATA_TXN (PCIE_TX0N)	48	NC
49	SATA_TXP (PCIE_TX0P)	50	PERST#
51	GND	52	PECLKREQ#
53	REFCLKN	54	PEWAKE#
55	REFCLKP	56	NC
57	GND	58	NC
Key			
67	NC	68	SUSCLK
69	PEDET	70	VCC3
71	GND	72	VCC3
73	GND	74	VCC3
75	GND		

Audio

Connector application: Mic in, Line out
Connector location: MIC_LOUT



Pin	Definition
1	LINE_OUT_R
2	LINE_JD
3	AGND
4	LINE_OUT_L
5	AGND
6	MIC_IN_R
7	MIC_JD
8	MIC_IN_L
9	AGND

System Power Button 2

Connector location: PWR_SW2

Pin	Definition
1	GND
2	PWRBTN#

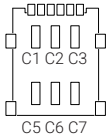
System Reset

Connector location: RESET

Pin	Definition
1	GND
2	RESET#

SIM Card

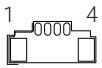
Connector form factor: nano-SIM
Connector location: SIM



Pin	Definition
C1	VCC
C2	RST
C3	CLK
C5	GND
C6	VPP
C7	I/O

Internal Speaker (with Audio Amplifier)

Connector location: SPK



Pin	Definition
1	L+
2	L-
3	R+
4	R-

USB 2.0

Connector location: USB2_36P

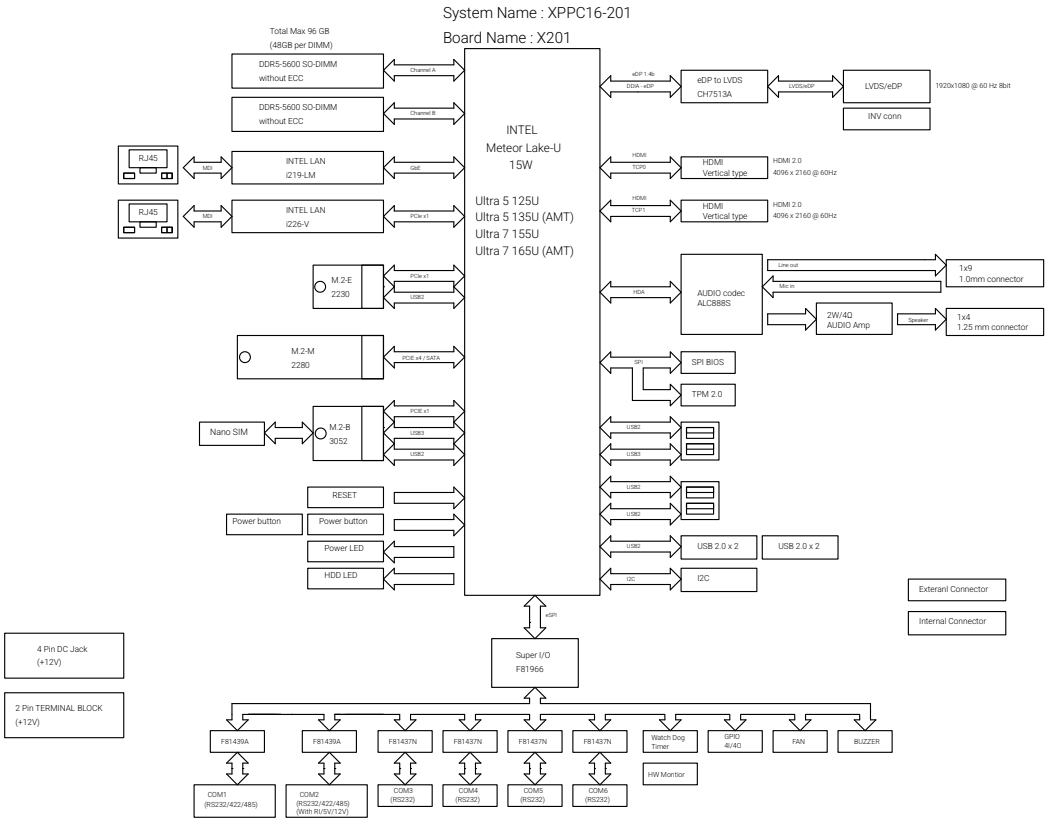
Pin	Definition
1	GND
2	USB_A-
3	USB_A+
4	USB_B-
5	USB_B+
6	+5V

USB 2.0

Connector location: USB2_47P

Pin	Definition
1	GND
2	USB_A-
3	USB_A+
4	USB_B-
5	USB_B+
6	+5V

Block Diagram



Chapter 3: System Setup

Prior to removing the top cover, make sure the unit's power is off and disconnected from the power sources to prevent electric shock or system damage.

Removing the Rear Panel of the Chassis

1. Remove the seven screws indicated in the images below.

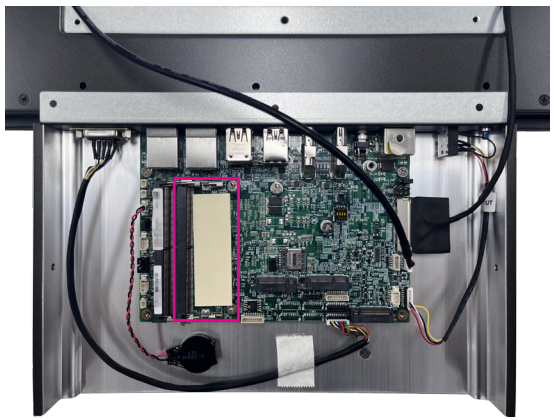
Rear Top

Rear Bottom

2. Once all screws have been removed, carefully lift off the rear cover slightly. Take care not to damage or pull any cables attached to the panel.

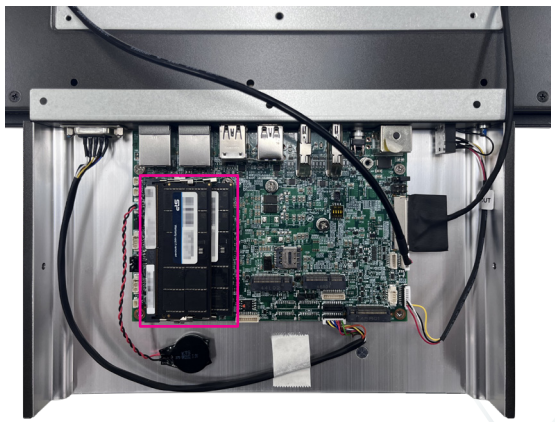
Installing the Memory Modules

1. Peel off the protective films attached to the thermal pad on both sides, then apply it to the motherboard at the location shown below, which between DIMM1 socket and the motherboard.



If the installed memory module is single-rank, use the thermal pad with P/N: 5060200720X00 included in the package. If the installed memory module is dual-rank, please purchase an additional thermal pad with P/N: 5060200706X00 separately.

2. Insert the module into the socket at an approximately 30-degree angle. Push the module down until the clips on both sides of the socket lock into position. The gold-plated connector on the edge of the module will almost completely disappear inside the socket. Repeat the same procedure to insert the second memory module, if required.

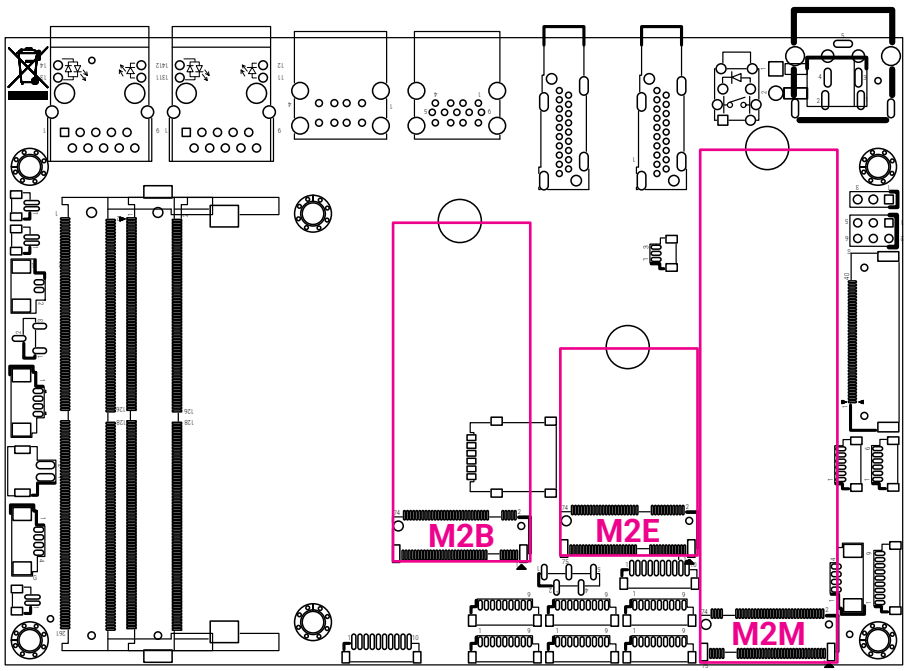


3. Peel off the protective film from the thermal pad (P/N: 5060200706X00), then apply it to the second memory module.

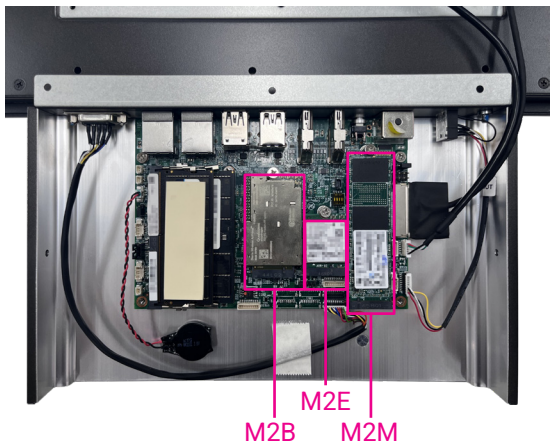
- Each memory socket supports up to 48 GB.
- There is no specific order when inserting the memory modules into the sockets, as long as the thermal pad(s) are applied.
- If only DIMM2 is installed, do not place the thermal pad (P/N: 5060200720X00) between the PCB and DIMM1.
- Note that the thermal pads for memory DIMM1 and DIMM2 are different. Do not install them incorrectly.

Installing the Peripherals and Communication Modules

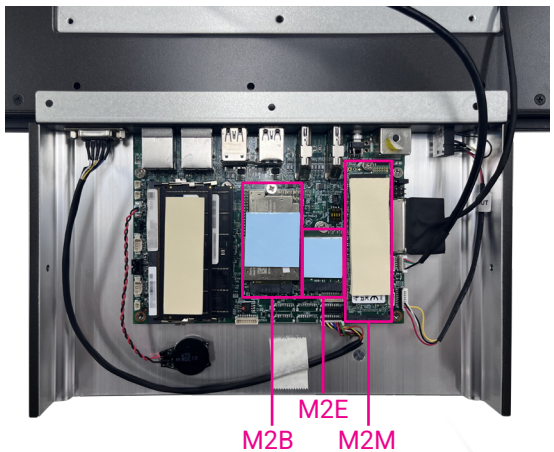
1. Refer to the image below for the location of each communication or peripheral module. The connectors from left to right are M.2 Key B (for LTE/5G module, M2B), M.2 Key E (for Wi-Fi module, M2E), and M.2 Key M (for storage module, M2M), respectively.



2. Insert the module you wish to install into the slot at a 45-degree angle until the gold-plated connector on the edge of the module completely disappears inside the slot. Push the module down and secure it using the screw(s) in the mounting hole.



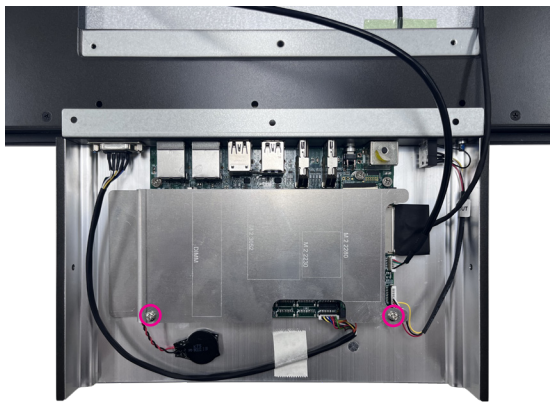
3. The thermal pad P/Ns from left to right are M2B (P/N: 5060200376X00), M2E (P/N: 5060200510X00), and M2M (P/N: 5060200706X00).



Reinstalling the Rear Panel

1. Once the installation procedures in the previous section are completed, peel off the protective films on both sides of the thermal pad (P/N: 5060200954X00), then apply the thermal pad to the memory cover.

2. Secure the memory cover with screws (P/N: 50311F0365X00) at the locations indicated below.



3. Reassemble the rear panel onto the chassis, taking care not to pull or damage the cables.

Chapter 4: BIOS Setup

This chapter describes how to use the BIOS setup program for XPPC 16-200. The BIOS screens provided in this chapter are for reference only and may change if the BIOS is updated in the future.

To check for the latest updates and revisions, visit the NEXCOM website at www.nexcom.com.tw.

About BIOS Setup

The BIOS (Basic Input and Output System) Setup program is a menu driven utility that enables you to make changes to the system configuration and tailor your system to suit your individual work needs. It is a ROM-based configuration utility that displays the system's configuration status and provides you with a tool to set system parameters.

These parameters are stored in non-volatile battery-backed-up CMOS RAM that saves this information even when the power is turned off. When the system is turned back on, the system is configured with the values found in CMOS.

With easy-to-use pull down menus, you can configure such items as:

- Hard drives, diskette drives, and peripherals
- Video display type and display options
- Password protection from unauthorized use
- Power management features

The settings made in the setup program affect how the computer performs. It is important, therefore, first to try to understand all the setup options, and second, to make settings appropriate for the way you use the computer.

When to Configure the BIOS

- This program should be executed under the following conditions:
- When changing the system configuration
- When a configuration error is detected by the system and you are prompted to make changes to the setup program
- When resetting the system clock
- When redefining the communication ports to prevent any conflicts
- When making changes to the Power Management configuration
- When changing the password or making other changes to the security setup

Normally, CMOS setup is needed when the system hardware is not consistent with the information contained in the CMOS RAM, whenever the CMOS RAM has lost power, or the system features need to be changed.

Default Configuration

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

Entering Setup

When the system is powered on, the BIOS will enter the Power-On Self Test (POST) routines. These routines perform various diagnostic checks; if an error is encountered, the error will be reported in one of two different ways:

- If the error occurs before the display device is initialized, a series of beeps will be transmitted.
- If the error occurs after the display device is initialized, the screen will display the error message.

Powering on the computer and immediately pressing Del allows you to enter Setup.

Scroll Bar

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

Submenu

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

Legends

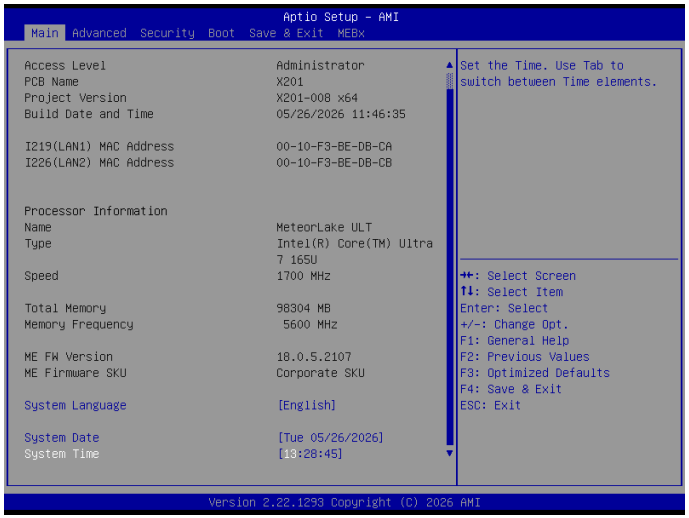
Key	Function
← →	Moves the highlight left or right to select a menu.
↑ ↓	Moves the highlight up or down between sub-menus or fields.
Esc	Exits the BIOS Setup Utility.
+	Scrolls forward through the values or options of the highlighted field.
-	Scrolls backward through the values or options of the highlighted field.
Tab ⇄	Selects a field.
F1	Displays General Help.
F2	Load previous values.
F3	Load optimized default values.
F4	Saves and exits the Setup program.
Enter ↵	Press <Enter> to enter the highlighted sub-menu

BIOS Setup Utility

Once you enter the AMI BIOS Setup Utility, the Main Menu will appear on the screen. The main menu allows you to select from several setup functions and one exit. Use arrow keys to select among the items and press Enter to accept or enter the submenu.

Main

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



System Language

Choose the system default language.

System Date

The date format is <day>, <month>, <date>, <year>. Day displays a day, from Monday to Sunday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 2005 to 2099.

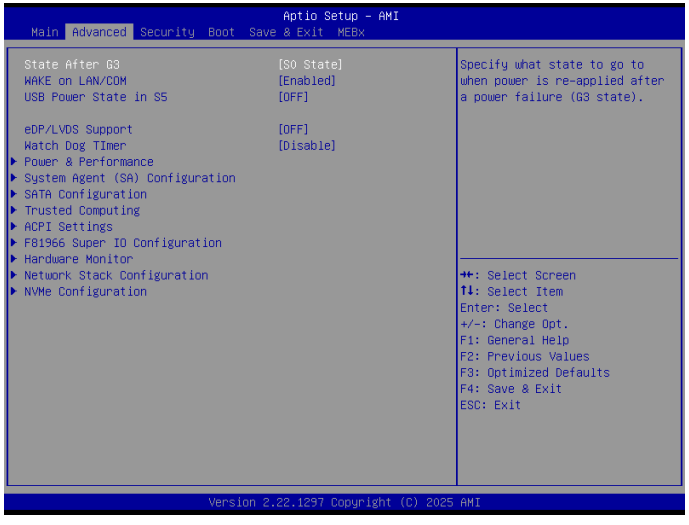
System Time

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

Advanced

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

Setting incorrect field values may cause the system to malfunction.



State after G3

Specify what state to go to when power is re-applied after a power failure (G3 state)

Wake on LAN/COM

Enable or Disable the integrate LAN & COM port RI to wake the system.

USB Power State in S5

Configures the USB power state in S5.

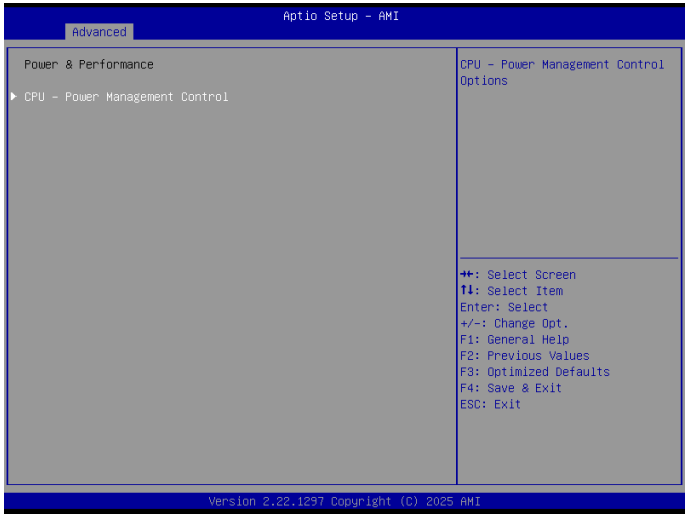
eDP/LVDS Support

Enable or disable eDP/LVDS support

Watch Dog Timer

Enable or disable watch dog timer.

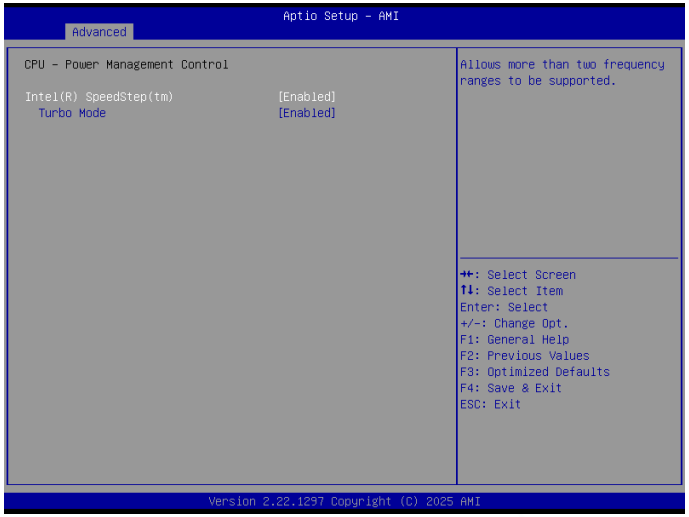
Power & Performance



CPU - Power Management Control

Press <Enter> to open the submenu.

Power & Performance > CPU - Power Management Control



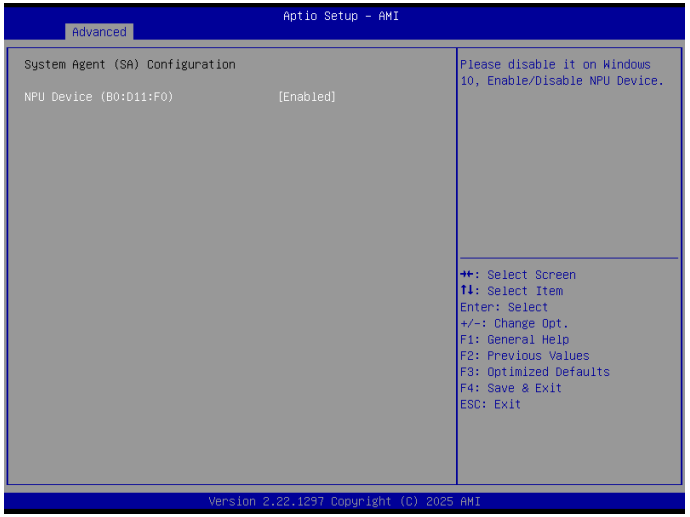
Intel(R) SpeedStep(tm)

Allow more than two frequency ranges to be supported.

Turbo Mode

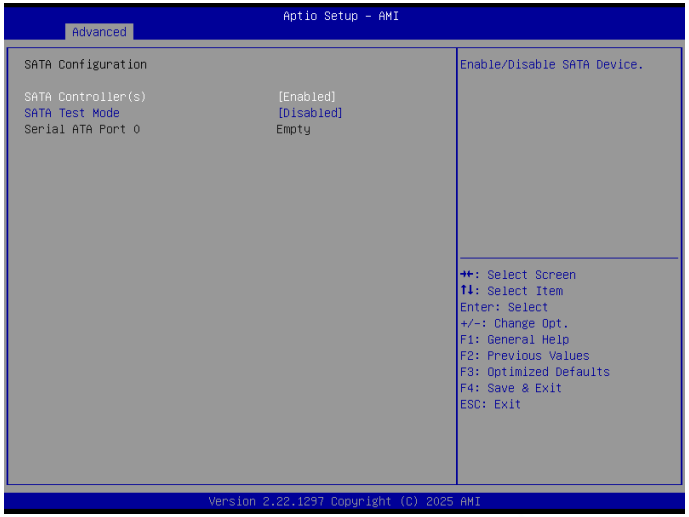
Enable or disable turbo mode.

System Agent (SA) Configuration



NPU Device (B0:D11:F0)
Please disable it on Windows 10. Enable or disable NPU device.

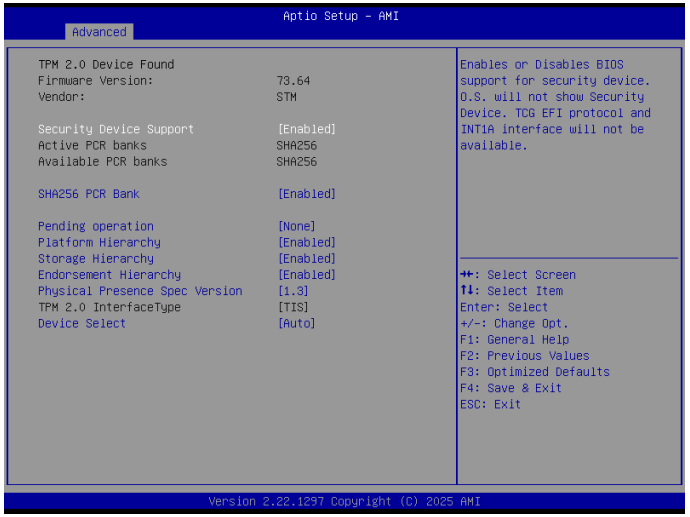
SATA Configuration



SATA Controller(s)
Enable or disable SATA device.

SATA Test Mode
Enable or disable SATA test mode.

Trusted Computing



Security Device Support
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.

SHA256 PCR Bank
Enable or disable SHA256 PCR Bank.

Pending Operation
Configure the operation mode for the security device.

Platform Hierarchy
Enable or disable platform hierarchy.

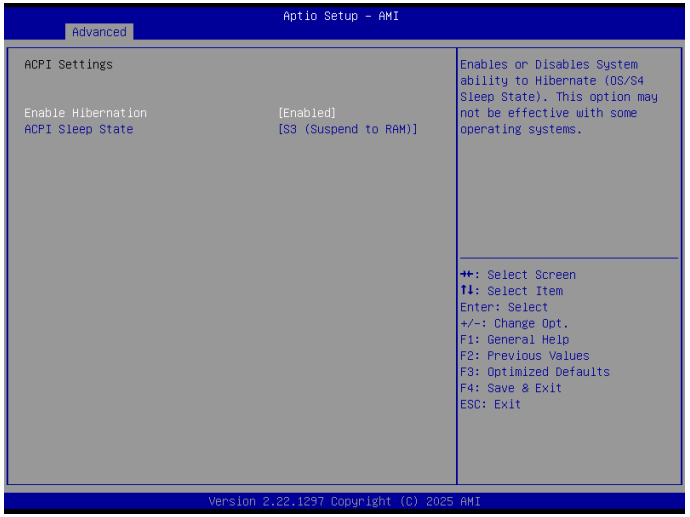
Storage Hierarchy
Enable or disable storage hierarchy.

Endorsement Hierarchy
Enable or disable endorsement hierarchy.

Physical Presence Spec Version
Configure the physical presence spec version.

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 TPM 1.2 and 2.0 devices with the default set to TPM 2.0 devices if not found, and TPM 1.2 devices will be enumerated.

ACPI Settings



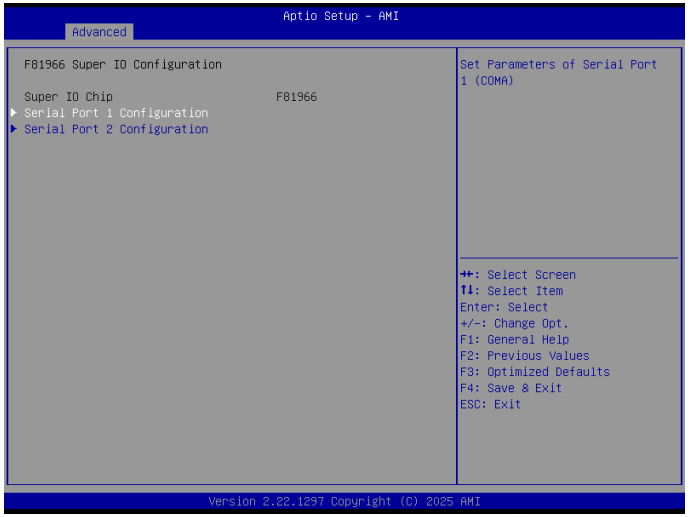
Enable Hibernation

Enable or disable system ability to hibernate (OS/S4 Sleep State). This option may not be effective with some operating systems.

ACPI Sleep State

Select the highest ACPI sleep state the system will enter when the suspend button is pressed. The options are Suspend Disabled and S3 (Suspend to RAM).

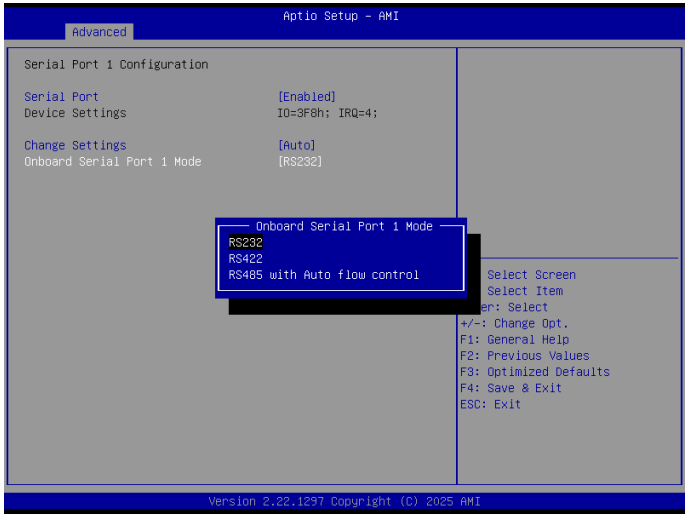
F81966 Super IO Configuration



Serial Port 1/2 Configuration

Press <Enter> to open the submenu.

F81966 Super IO Configuration > Serial Port 1 Configuration

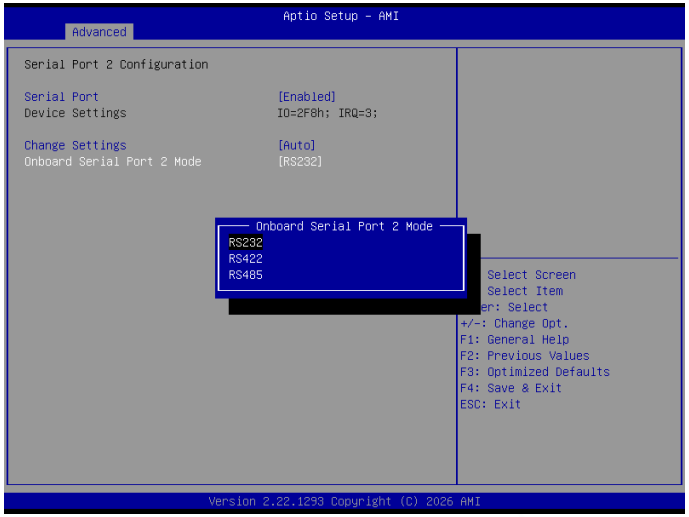


Serial Port
Enable or disable the serial COM port.

Change Settings
Select an optimal setting for the Super IO device.

Onboard Serial Port 1 Mode
Select this to change the serial port mode to RS-232, RS-422, or RS-485.

F81966 Super IO Configuration > Serial Port 2 Configuration



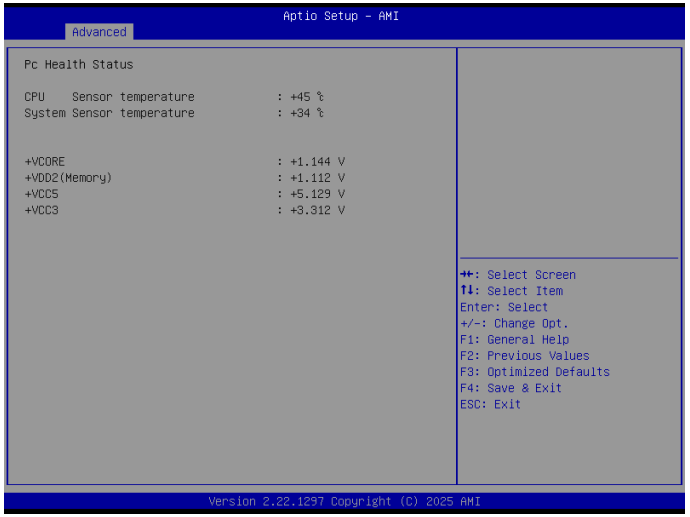
Serial Port
Enable or disable the serial COM port.

Change Settings
Select an optimal setting for the Super IO device.

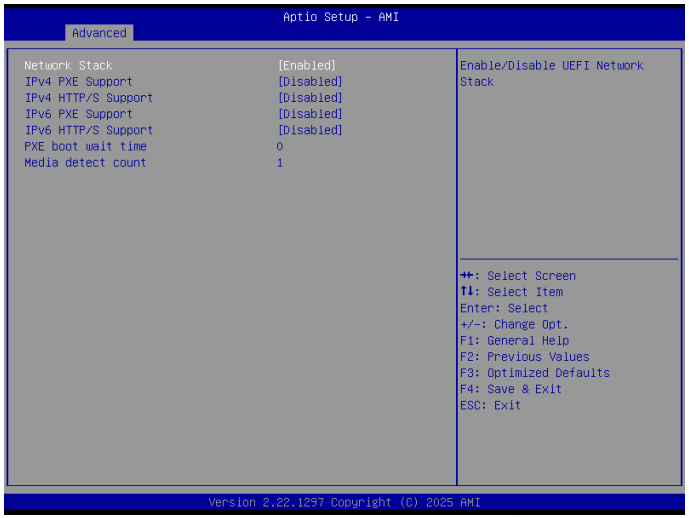
Onboard Serial Port 2 Mode
Select this to change the serial port mode to RS-232, RS-422, or RS-485.

Hardware Monitor

This section is used to monitor hardware status such as temperature and voltages.



Network Stack Configuration



Network Stack

Enable or disable UEFI network stack.

IPv4 PXE Support

Enable or disable IPv4 PXE support. If disabled, the IPv4 boot option will not be created.

IPv4 HTTP Support

Enable or disable IPv4 HTTP support. If disabled, the IPv4 HTTP boot option will not be available.

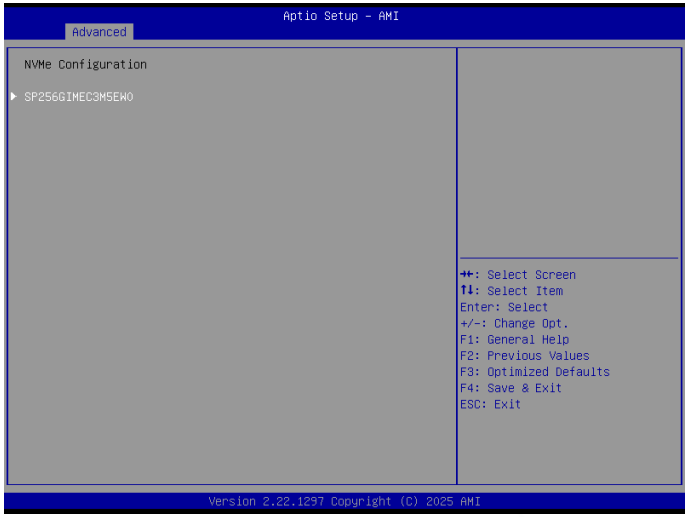
IPv6 PXE Support
Enable or disable IPv6 PXE support. If disabled, the IPv6 PXE boot option will not be available.

IPv6 HTTP Support
Enable or disable Ipv6 HTTP support. If disabled, the IPv6 HTTP boot option will not be available.

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

Media detect count
Configure the number of times the media will be checked. Use either+/- or numeric keys to set the value.

NVMe Configuration



An NVMe device appears in the BIOS when connected. The detected device depends on the connected hardware. Press <Enter> for more configuration options.

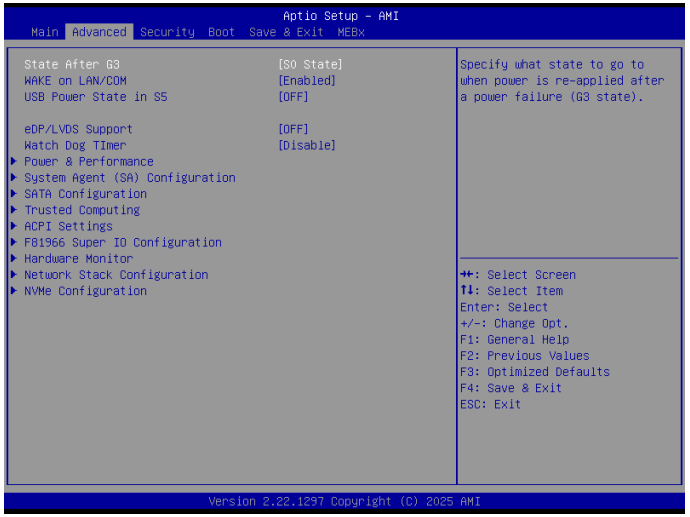
NVMe Configuration >

Self Test Option
Select either short or extended self test. Short option will take couple of minutes and e-xtended option will take several minutes to complete.

Self Test Action
Configure the items used for self test. Controller Only Test and Controller and NameSpace Test options are available. Selecting Controller and NameSpace Test will take longer to complete.

Run Device Self Test
Run the device self test according to the self test option and action selected. Pressing the Esc key will abort the test.

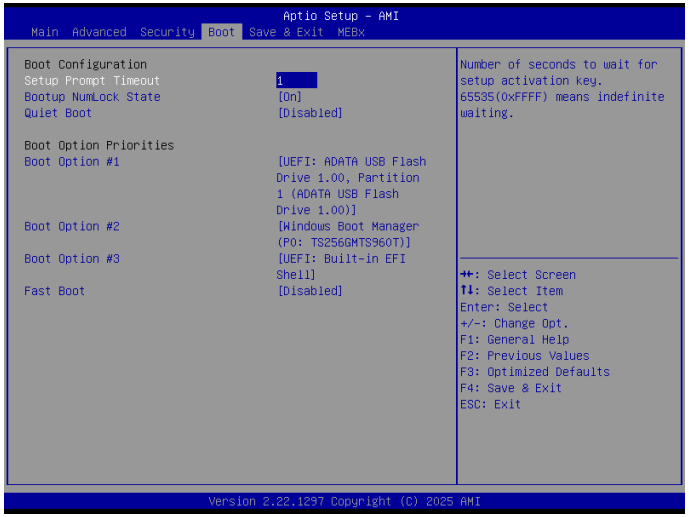
Security



Administrator Password
Select this to reconfigure the administrator's password.

Secure Boot
Press <Enter> to open the submenu.

Boot



Setup Prompt Timeout
Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.

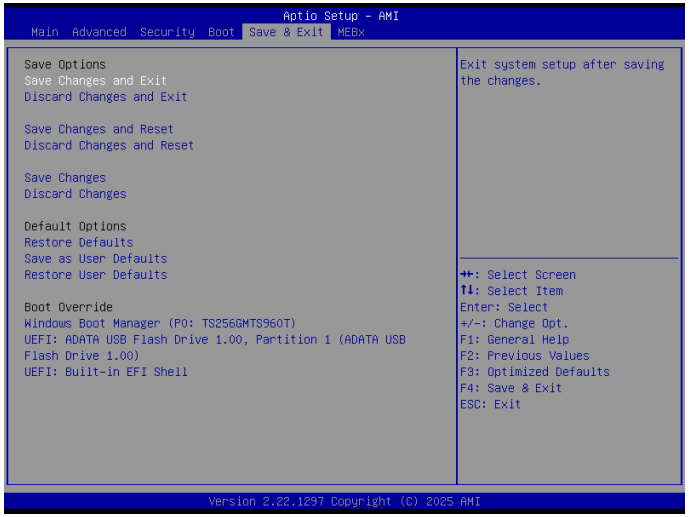
Bootup NumLock State
This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on wherein the function of the numeric keypad is the number keys. When set to Off, the function of the numeric keypad is the arrow keys.

Quiet Boot
Enabled Display OEM logo instead of the POST messages.
Disabled Display normal POST messages.

Boot Option Priorities
Adjust the boot sequence of the system. Boot Option #1 is the first boot device that the system will boot from, next will be #2 and so forth.

Fast Boot
When enabled, the BIOS will shorten or skip some check items during POST. This will decrease the time needed to boot the system.

Save & Exit



Save Changes and Exit
To save the changes and exit the Setup utility, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes. You can also press <F4> to save and exit Setup.

Discard Changes and Exit
To exit the Setup utility without saving the changes, select this field then press <Enter>. You may be prompted to confirm again before exiting. You can also press <ESC> to exit without saving the changes.

Save Changes and Reset
To save the changes and reset, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes.

Discard Changes and Reset
To exit the Setup utility and reset without saving the changes, select this field then press <Enter>. You may be prompted to confirm again before exiting.

Save Changes
To save changes and continue configuring the BIOS, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes.

Discard Changes
To discard the changes, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes to discard all changes made and restore the previously saved settings.

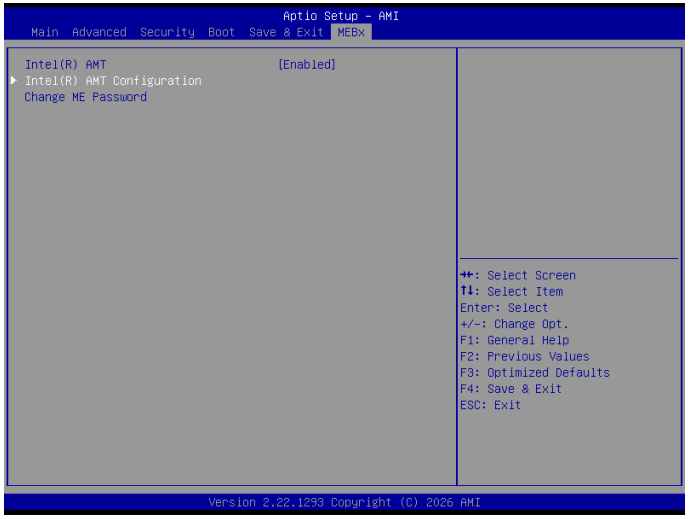
Restore Defaults
To restore the BIOS to default settings, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes.

Save as User Defaults
To use the current configurations as user default settings for the BIOS, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes.

Restore User Defaults
To restore the BIOS to user default settings, select this field then press <Enter>. A dialog box will appear. Confirm by selecting Yes.

Boot Override
To bypass the boot sequence from the Boot Option List and boot from a particular device, select the desired device and press <Enter>.

MEBx



Intel(R) AMT
Enable or disable Intel® AMT.

Intel(R) AMT Configuration
Press Enter to access the sub-menu.

Intel(R) ME Password
MEBx Login and configure AMT BIOS features.

Appendix A: Power Consumption

Hardware Configuration

Item	Description
System	XPPC16-201-165U
CPU	Intel® Meteor Lake Ultra 7 165U
System memory	48GB DDR5 5600 SODIMM
Wi-Fi Module	Realtek RTL8822BE
5G Module	Quectel RM520N-GL
Storage Device	M.2 Key M 2280 512GB SSD
Operating System	Windows11 pro x64 (23H2)

Test Condition

Burn-in item(100%)	Test
2D Graphic	✓
3D Graphic	✓
CPU	✓
Disk	✓
GPGPU	✓
Serial Port	✓
Sound	✓
Video playback	✓
Memory (RAM)	✓
Network	✓
USB Port x4 (Connect dummy load 1Ax2, keyboard and mouse)	✓

Test Data

Test voltage	12V
S3	7.68W(Watts)
Idle	18.72W(Watts)
Full load	48.72W(Watts)
Power consumption of add-on module	
Wi-Fi Module	3W(Watts)
5G/LTE Mode	5.6W(Watts)