SP-151C-1N305
SP-181C-1N305
SP-241C-1N305

Industrial Fanless Panel PC
w/ Intel® Core i3-N305 Processor

User's Manual

Version 1.0

2025.07

Revision History

Version	Date	Description
1.0	2025.07	Initial release

Copyright Notice

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

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

Declaration of Conformity

CE

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

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

Warning

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

FCC Class A

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

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE:

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

RoHS

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

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

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

SVHC / REACH

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

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

Important Safety Instructions

Read these safety instructions carefully

1. Read all cautions and warnings on the equipment.
2. Place this equipment on a reliable surface when installing. Dropping it or letting it fall may cause damage
3. Make sure the correct voltage is connected to the equipment.
4. For pluggable equipment, the socket outlet should be near the equipment and should be easily accessible.
5. Keep this equipment away from humidity.
6. The openings on the enclosure are for air convection and protect the equipment from overheating. DO NOT COVER THE OPENINGS.
7. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
8. Never pour any liquid into opening. This may cause fire or electrical shock.
9. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
10. 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 or damaged.
    f. The equipment has obvious signs of breakage.
11. Keep this User's Manual for later reference.

Warning

The Panel PC and its components contain very delicately Integrated Circuits (IC). To protect the Panel PC and its components against damage caused by static electricity, you should always follow the precautions below when handling it:

1. Disconnect your Panel PC from the power source when you want to work on the inside.
2. Use a grounded wrist strap when handling computer components.
3. Place components on a grounded antistatic pad or on the bag that came with the Panel PC, whenever components are separated from the system.

Lithium Battery Replacement

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

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

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

Technical Support

If you have any technical difficulties, please consult the user's manual first at:
http://www.arbor-technology.com

Please do not hesitate to call or e-mail our customer service when you still cannot find out the answer.

https://www.arbor-technology.com

E-mail: info@arbor.com.tw

Warranty

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

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

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

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

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Chapter 1

Introduction

1.1. The Computer

Product Highlights

- Intel® Alder Lake-N Core™ i3-N305 Processor (8 cores, up to 3.8GHz)
- 23.8"/18.5"/15.6" FHD LCD Panel with LED backlight, Front Panel support IP66
- Industrial-grade 10 points project capacitive touch screen
- 1 x DDR5 4800MHz SO-DIMM Slot, up to 16GB
- Support 2 x 2.5GbE LAN
- Wide voltage 12~36V DC-IN, lockable Phoenix connector
- Support remote ON-OFF
- Grounding protection for product shell
- Support 1 x 2.5 inches HDD/SSD expansion
- Support standard VESA and panel mount
- Support Over-Voltage & Reversed Power Insertion Protection

1.2. About this Manual

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

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

1.3. Specifications

System		
CPU	Intel® Core™ i3-N305 (6M Cache, up to 3.8GHz)	
Memory	Single Channel, 1 x SO-DIMM Slot, DDR5 4800MHz, up to 16GB	
Graphics	Intel® UHD Graphics	
LAN Chipset	2 x RJ45, Intel® I226-V 2.5GbE controllers	
Watchdog Timer	Programmable 255 levels timer interval, from 1~255 sec/min	
Storage		
Device	1 x M.2 M key 2242/2280 slot (SATA signal) 1 x M.2 M key 2242/2280 slot (PCIe x4 NVMe signal) (OEM Request) 1 x SATA 3.0 (2.5" HDD/SSD drive bay) **Note for M.2 2242/2280 PCIe x4 NVMe (OEM Request): When OEM Request is executed, M.2 SATA & 2.5" SATA are disabled.**	
Audio		
Type	1 x Audio(Line-out & Mic-in 2 in 1), Realtek®ALC888S HD Audio codec	
Speaker	2 x 4Ω 3W speakers	
LCD Display		
Size/Type	SP-151C-1N305 SP-181C-1N305 SP-241C-1N305	15.6" TFT LCD Panel 18.5" TFT LCD Panel 23.8" TFT LCD Panel
Max. Resolution	1920(H) x 1080(V)	
Ratio	16:9	
Luminance	SP-151C-1N305 SP-181C-1N305 SP-241C-1N305	350 cd/m² 350 cd/m² 250 cd/m²
Contrast Ratio	SP-151C-1N305 SP-181C-1N305 SP-241C-1N305	1000:1 1000:1 3000:1
Backlight	LED Backlight	
Backlight Lifetime	50,000 Hrs	
Touch Screen	P-cap Multi-Touch	
Touch	35,000,000 times	
View Angle	SP-151C-1N305 SP-181C-1N305 SP-241C-1N305	CR ≥ 10, θx 178°(H)/ θy 178° (V) CR ≥ 10, θx 170°(H)/ θy 170° (V) CR ≥ 10, θx 178°(H)/ θy 178° (V)
Power System		
Power Input	DC 10~36V 1 x Power Connector (2P Phoenix)	

Qualification		
Certification	CE, FCC	
External I/O		
Serial Ports	1 x RS232/RS422/RS485(COM1) with DB9 1 x RS232(default)/RS485(Jumper)(COM2) with DB9 1 x RS232(COM3) with DB9	
USB Ports	2 x USB2.0, 2 x USB3.2	
LAN	2 x RJ45, Intel® I226-V 2.5GbE controllers	
Video Ports	1 x HDMI® (up to 4096 x 2160@60Hz)	
Remote On-Off	1 x Remote ON-OFF Switch	
Internal I/O		
Expansion	1 x M.2 E key 2230 (PCIe x1/USB 2.0 signal) support CNVi 1 x 8bit GPIO 3.3V(jumper)/5V(default) Power voltage 2 x RS232 by pin header	
Mechanical		
Front Panel	Aluminum	
Heat-Sink	Aluminum	
Rear Cover	SECC	
Power button	1 x Power button W/LED	
Mounting Type	Panel Mount, Wall and VESA-mount (75 x 75mm)	
Dimension (W x H x D)	SP-151C-1N305 SP-181C-1N305 SP-241C-1N305	395.0(W) x 245.5(H) x 66(D)mm 470.5(W) x 295.6(H) x 67(D)mm 594.3(W) x 366.6(H) x 70(D)mm
Cut out	SP-151C-1N305 SP-181C-1N305 SP-241C-1N305	387.0 x 237.5mm 457.5 x 282.6mm 581.3 x 353.6mm
Weight	SP-151C-1N305 SP-181C-1N305 SP-241C-1N305	4.2 kg 6.2 kg 8.2 kg
Ingress Protection	Front panel IP66	
Environmental		
Operating Temp.	-10 ~ 60°C (14 ~ 140°F), ambient w/ air flow (WT RAM & SSD)	
Storage Temp.	-40 ~ 70°C (-40~ 158°F)	
Operating Humidity	5 ~ 95% (non-condensing)	
Random Vibration	5~500Hz, 2Grms (SSD) operation	
Shock	Operation: 10G@11ms Non-operation: 30G@11ms	
OS Support		
Windows 10/11, Ubuntu 22.04		

1.4. Inside the Package

Upon opening the package, carefully inspect the contents. If any of the items is missing or appears damaged, contact your local dealer or distributor. The package should contain the following items:

1 x SP-151C-1N305 or 1 x SP-181C-1N305 or SP-241C-1N305

(15.6" P-Cap Touch Panel PC / 18.5" P-Cap Touch Panel PC / 23.8" P-Cap Touch Panel PC)

*Product appearance varies by model.

1 x Accessory Box that contains the following items:

- 2Pin DC-IN Phoenix connector x 1
- 2Pin Remote SW Phoenix connector x 1
- Panel Hook (SP-181C-1N305/SP-241C-1N305 x 8pcs, SP-151C-1N305 x 4pcs)
- Screws package x1
- Memory & M.2 2242 Thermal PAD x 4
- CPU Thermal PAD x 1
- 22-pin SATA & Power cable x 1

1.5. Ordering Information

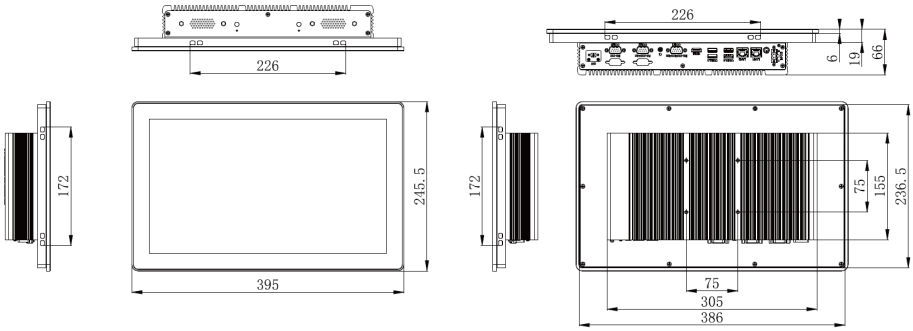
SP-151C-1N305	15.6"(16:9) Panel PC, Intel® Core™ i3-N305 processor, HDMI*1, USB*4, LAN*2, COM*5, DC10~36V power input
SP-151C-1N305-R8S128	15.6"(16:9) Panel PC with commercial 8GB RAM & 128GB SSD, Intel® Core™ i3-N305 processor, HDMI*1, USB*4, LAN*2, COM*5, DC10~36V power input
SP-181C-1N305	18.5"(16:9) Panel PC, Intel® Core™ i3-N305 processor, HDMI*1, USB*4, LAN*2, COM*5, DC10~36V power input
SP-181C-1N305-R8S128	18.5"(16:9) Panel PC with commercial 8GB RAM & 128GB SSD, Intel® Core™ i3-N305 processor, HDMI*1, USB*4, LAN*2, COM*5, DC10~36V power input
SP-241C-1N305	23.8”(16:9) Panel PC with Intel® Core™ i3-N305 processor, HDMI*1, USB*4, LAN*2, COM*5, DC10~36V power input
SP-241C-1N305-R8S128	23.8”(16:9) Panel PC with commercial 8GB RAM & 128GB SSD, Intel® Core™ i3-N305 processor, HDMI*1, USB*4, LAN*2, COM*5, DC10~36V power input
PAC-120W-FSP-SPA-US R1.0	AC/DC Adapter Kit (w/ UKCA), 19V, 120W, 2 WIRE w/ US POWER CORD
PAC-120W-FSP-SPA-EU R1.0	AC/DC Adapter Kit (w/ UKCA), 19V, 120W, 2 WIRE w/ EU POWER CORD
PAC-120W-FSP-SPA-UK R1.0	AC/DC Adapter Kit (w/ UKCA), 19V, 120W, 2 WIRE w/ UK POWER CORD
PAC-120W-FSP-SPA-IN R1.0	AC/DC Adapter Kit (w/ UKCA), 19V, 120W, 2 WIRE w/ IN POWER CORD
PAC-120W-FSP-SPA-JP R1.0	AC/DC Adapter Kit (w/ UKCA), 19V, 120W, 2 WIRE w/ JP POWER CORD
8bit GPIO cable	200mm, DB9M TO HSG2*5P(2.0), 8bit GPIO, W/O BRACKET, W/ SCREW
COM4 cable	150+/-10mm, DB9M TO HSG2*5P(2.0), 9-Wire COM4, W/O BRACKET, W/SCREW
COM5 cable	150+/-10mm, DB9M TO HSG2*5P(2.0), 3-Wire COM5, W/O BRACKET, W/SCREW

Chapter 2

Getting Started

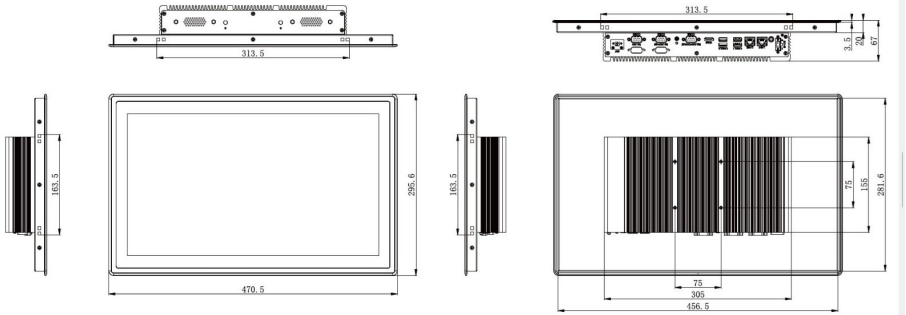
2.1. Dimensions

SP-151C-1N305



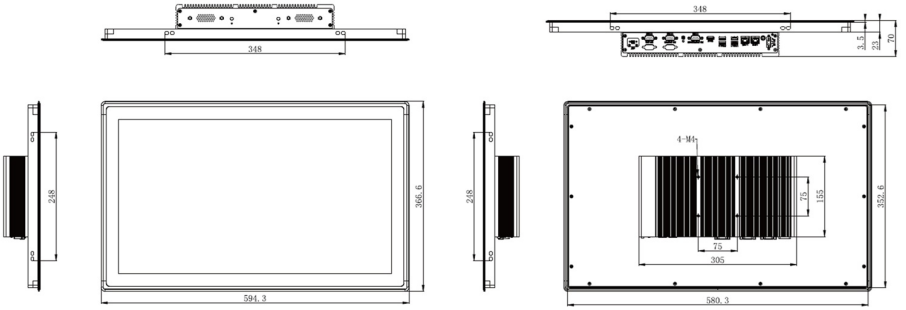
Unit: mm

SP-181C-1N305



Unit: mm

SP-241C-1N305



Unit: mm

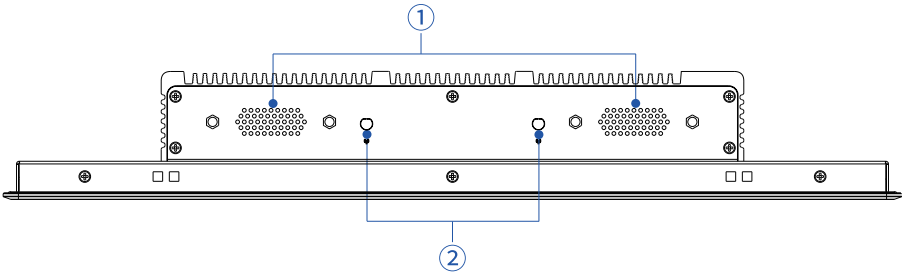
2.2. Tour the Computer

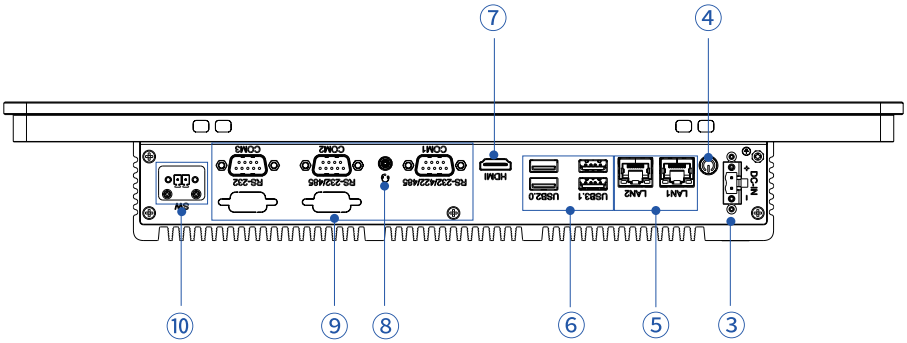
Take a look around the computer and find the external controls and connectors.

2.2.1. Front View

*Product appearance may vary by model.

2.2.2. Top & Bottom I/O View





No.	Description
①	Built-in Speaker
②	Antenna Reserved hole
③	DC-IN
④	Power On/Off Button
⑤	RJ45 LAN ports
⑥	USB 3.1 and 2.0 ports
⑦	HDMI port
⑧	Audio(Line-out&Mic-in 2 in 1)
⑨	COM port 1~3 + COM port 4~5 (Reserved hole)
⑩	Remote On/Off Switch

2.2.3. I/O Definition

② Antenna Reserved hole

Function Two antenna reserved holes are on top of the product to facilitate users' installation of the antenna for the wireless module.

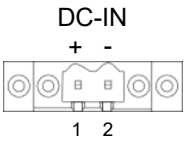
③ DC-IN

Function: Power input terminal block

Connector Type: 1x2-pin Terminal block

Pin Assignment:

Pin	Description
1	+10~36V DC-in
2	GND



④ Power On/Off Button

Function Power Button

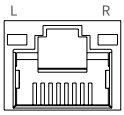
Description	Status
Power LED Status	► Off: System is Power off ► Green LED On Permanently: System is power on ► Green LED Blinking: S3 Sleeping States

⑤ RJ45 LAN ports

Function: RJ-45 port for Giga Lan

Connector Type: 2 x RJ-45 connectors, that LAN1 and LAN2 support 10/100/1000/2500Mbps high speed Ethernet.

Pin Assignment: The pin assignments conform to the industry standard.



Two network interfaces are supported with 10/100/1000/2500 Mbps. Both network ports use Intel i226-V network chip and can support network wake-on-LAN function. There are 2 indicators on the network port, the specific definitions are as follows:

LED Indicator	Description	Status
L	Networking Status	Off: Non working Green: Working
R	Networking Speed Status	Off: 10 Mbps Green: 100 Mbps Orange: 1000/2500 Mbps

⑥ USB Ports

Function: USB 3.2 / USB 2.0 ports

Connector Type: USB 3.2 / USB 2.0 type A connectors

Pin Assignment: The pin assignments conform to the industry standard.

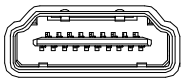
USB Version	Theoretical maximum speed	Speed	Maximum voltage/ current
USB2.0	480Mbps	High-Speed	5V/500mA
USB3.2	10Gbps	Super-Speed	5V/900mA

⑦ HDMI

Function: HDMI display output

Pin Assignment: The pin assignments conform to the industry standard. Maximum resolution:

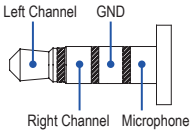
4096(H) x 2160(V)



⑧ Audio(Line-out & Mic-in 2 in 1)

Function: For external microphone, headphones or speakers.
Connector Type: 3.5mm audio port interface

Pin Assignment: Support a 2-in-1 audio I/O interface with a 3.5mm hole diameter for external microphones, headphones, or speakers on a 4-segment iPhone version devices.



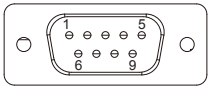
Note: The microphone and GND of the Android version are opposite to those of the iPhone version, and cannot be shared.

⑨ COM Ports

Function: RS-232/422/485 Selectable Serial Port. The product supports 5 serial ports, COM1 supports RS232/422/485 mode; COM2 supports RS232/485 mode. COM3/4/5 support RS232 mode. Under default settings, COM1 is in RS232 mode. COM1 can be switched to RS422/485 mode through BIOS settings. COM2 can be switched to RS485 mode through jumper settings. For specific setting methods.

Connector Type: External 9-pin D-sub male connector

Pin Assignment:



	Pin	Desc.	Pin	Desc
RS-232	1	DCD	6	DSR
	2	SIN	7	RTS
	3	SOUT	8	CTS
	4	DTR	9	RIS
	5	GND		
RS-422	1	TX-	6	N/A
	2	TX+	7	N/A
	3	RX+	8	N/A
	4	RX-	9	N/A
	5	GND		
RS-485	1	DATA-	6	N/A
	2	DATA+	7	N/A
	3	N/A	8	N/A
	4	N/A	9	N/A
	5	GND		

Note: COM1 supports RS-232/422/485 three modes. The modes can be set in BIOS mode. Please refer to 5.2.1. COM Mode Setting on page 36.

⑩ Remote On/Off Switch
2-pin terminal block

Function: 2-pin terminal block for remote control

Connector Type: 1x2-pin Terminal block

Pin Assignment:

Pin	Desc.
1	GND
2	PWR_SW

2.3. Driver Installation Note

To install the drivers, please visit our website at www.arbor-technology.com and download the driver pack from the product page.

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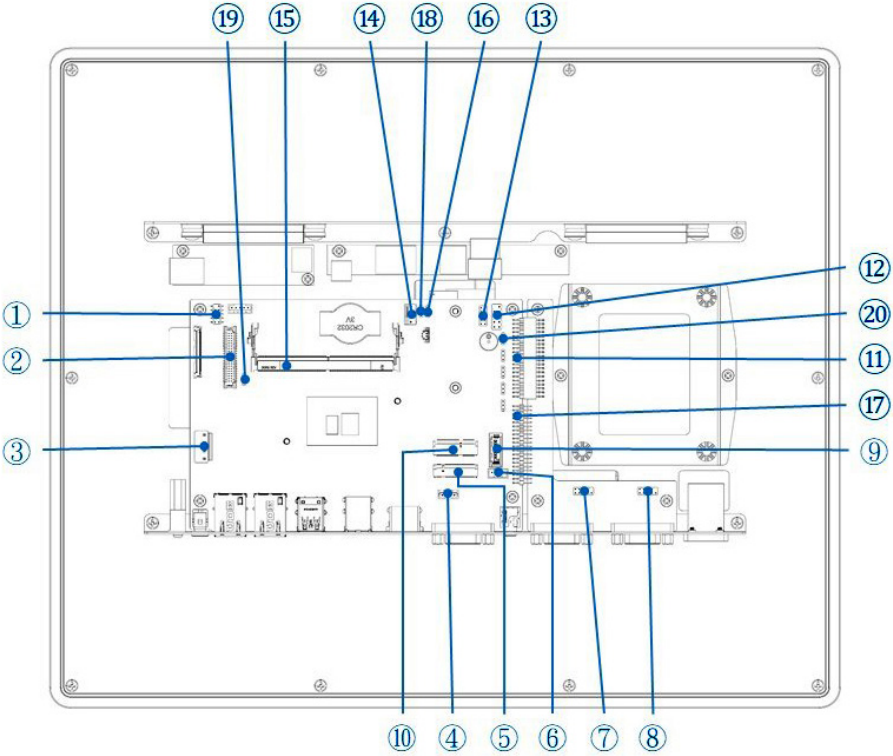
Chapter 3

Engine of the Computer

3.1. Board Layout

Main Board (SP-151C-1N305/SP-181C-1N305/SP-241C-1N305)



Item	Description	Silkscreen
①	USB Pin-header	JUSB1
②	LVDS Connector	JLVDS1
③	Power Connector	JPWR1
④	SATA Power Connector	SATAPWR1
⑤	M.2 M Key Slot	M2_SSD1
⑥	Speaker Connector	SPKER
⑦	COM Pin-header	JCOM4
⑧	COM Pin-header	JCOM5_6
⑨	SATA Slot	SATA1
⑩	M.2 E Key Slot	M2_WIFI1
⑪	External IO expansion Pin-header	J1
⑫	FP Pin-header	FP1
⑬	GPIO Pin-header	GPIO1
⑭	CPU FAN Connector	CPUFAN1
⑮	SO-DIMM Slot	DIMM1
⑯	AT/ATX Selection Jumper	JP1
⑰	Expansion Pin-header	J2
⑱	CMOS Jumper	JCMOS1
⑲	LVDS Power Jumper	LVDS_PWR1
⑳	GPIO Voltage Jumper	GPIO_PWR1

3.2. Jumper Setting

3.2.1 AT/ATX Selection Jumper setting (JP1)

Function: JP1 is the switching jumper between AT and ATX startup. AT is the auto-start mode when the power connect, and ATX is the key startup mode (default setting)

Jumper Type: 2.00 mm pitch 1x3-pin header

Setting:

Pin	Description	
Short 1-2	ATX mode (Default) (Start by Power Button)	
Short 2-3	AT mode (Start automatically after power on)	

3.2.2 CMOS jumper setting (JCMOS1)

Function: Clears/keeps CMOS

Jumper Type: 2.00 mm pitch 1x3-pin header

Setting:

Pin	Description	
Short 1-2	Keeps CMOS (Default)	
Short 2-3	Clears CMOS	

3.2.3 GPIO Voltage jumper setting(GPIO_PWR1)

Function: Switching between 3V or 5V voltage

Jumper Type: Onboard pitch 1x3-pin header

Setting:

Pin	Description	
Short 1-2	Support 3V (Default)	
Short 2-3	Support 5V	

3.3. Connector Setting

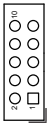
3.3.1 GPIO Pin-header (GPIO1)

Function: The mainboard has a built-in GPIO function expansion interface (GPIO1), which can realize the expansion of 8-bit GPIO function

Connector Type: 2x5-pin box header

Pin Assignment:

Pin	Description	Pin	Description
1	JPIO5	2	JPIO1
3	JPIO6	4	JPIO2
5	JPIO7	6	JPIO3
7	JPIO8	8	JPIO4
9	GPIO_DUAL	10	GND



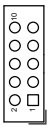
3.3.2 COM Pin-header (JCOM4)

Function: JCOM4 serial port through the cable, COM4 supports RS232 only, Support wake up function by default

Connector Type: 2x5 pin header

Pin Assignment:

Pin	Description	Pin	Description
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTD	8	RI
9	GND		



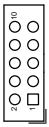
3.3.3 COM Pin-header (JCOM5_6)

Function: JCOM5_6 serial port through the cable, Not Support wake up function by default

Connector Type: 2x5 pin header

Pin Assignment:

Pin	Description	Pin	Description
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTD	8	RI
9	GND		



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Chapter 4

Installation & Maintenance

4.1. Disassembling and Assembling the Computer

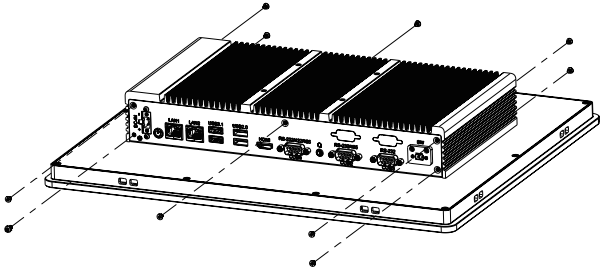
This section will guide you to install the Wi-Fi module and SSD. If you don't need to install the Wi-Fi module, skip the Wi-Fi related sections.

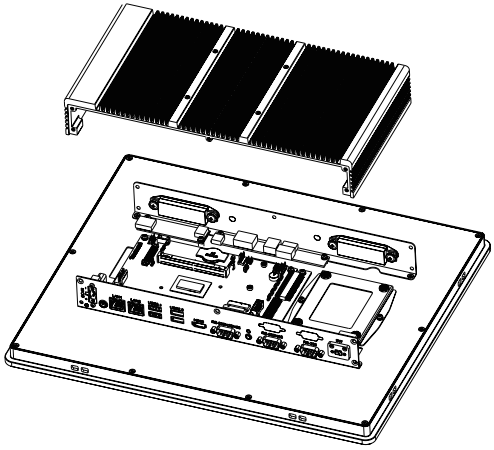
The installation procedures for SP-151C-1N305, SP-181C-1N305 and SP-241C-1N305. This section will use the SP-151C-1N305 to illustrate the procedures.

4.1.1. Disassembling the Computer

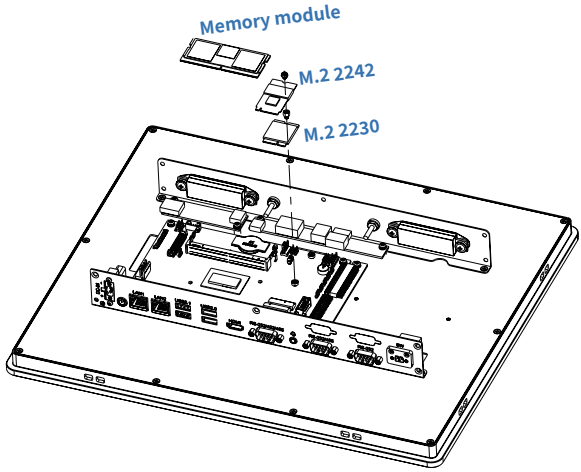
To use onboard jumpers/connectors or to install/remove internal components, you will need to open the computer to access the inside of the computer. Follow through the guide below to disassemble the computer.

1. Position the computer with the rear side facing up and remove screws securing the chassis as shown below .



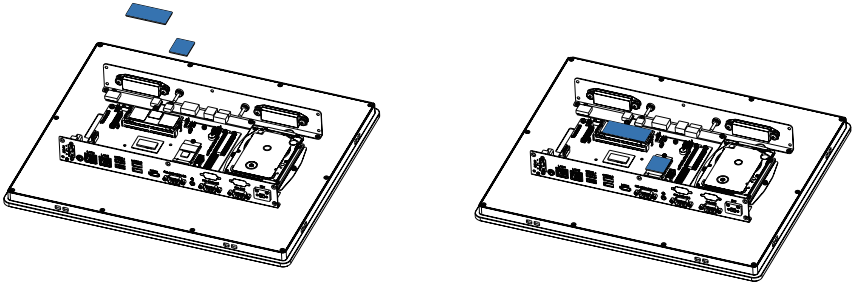


2. You are ready to access the components on the main board and make required configurations and connections.
3. Install the M.2 SSD (2242) and memory in the corresponding locations as shown in the figure. The WiFi module and SSD are located in the same interface and support M.2 2230. First, lock the hexagonal copper pillar in the accessory box to the corresponding position on the motherboard, and then use the accessory box screws to secure the SSD.



4.1.3 SSD/Memory module installation

4. Place the thermal pad in the accessory box on top of the M. 2 2242 and the memory module.



4.1.4 SSD and memory module installation method

5. Check the thermal pad to make sure there is nothing missing and follow the steps to lock the aluminum extruded heatsink back cover.

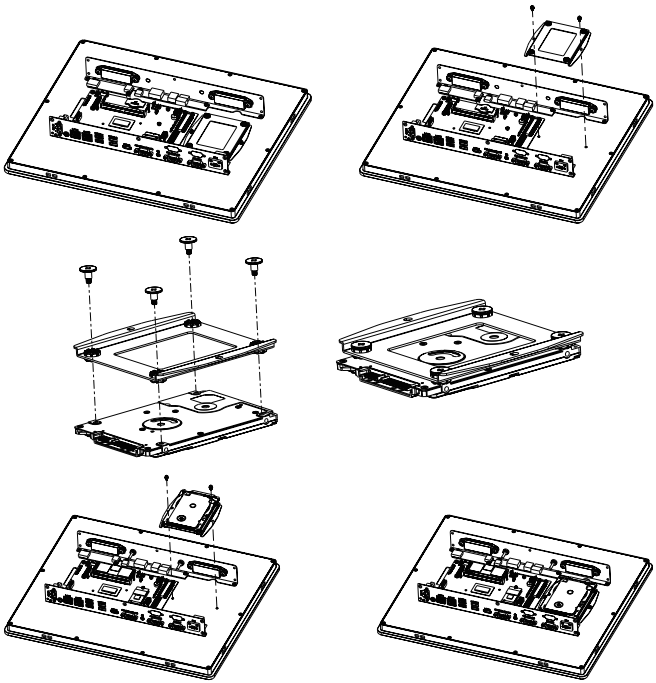
4.1.2. Assembling the Computer

After completing the required hardware installation and jumpers settings, assemble the computer by performing the proceeding steps in reverse order.

4.2 Install 2.5" SSD/HDD

1. Disassemble the heat sink aluminum extrusion according to step 4.1.1.

2. Install the 2.5-inch SSD/HDD into the bracket as shown below and secure it with 4 screws.

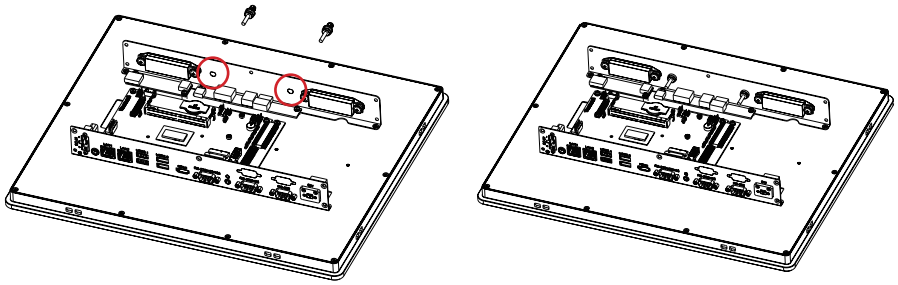


4.2 2.5" SSD/HDD installation method

3. Install the heat dissipation aluminum extrusion back cover by reversing the above steps.

4.3 Install WiFi/4G antenna

1. To install the antenna, please refer to the WiFi specifications to determine the corresponding number of antennas to be install. Users will need to use tools to remove the pre-punched holes in the antenna holes before installation. Please install the antenna according to the position shown in the below figure.



2. Plug the antenna into the corresponding Wi-Fi or socket, arrange the wiring and assemble the machine.

4.4 Mounting Method

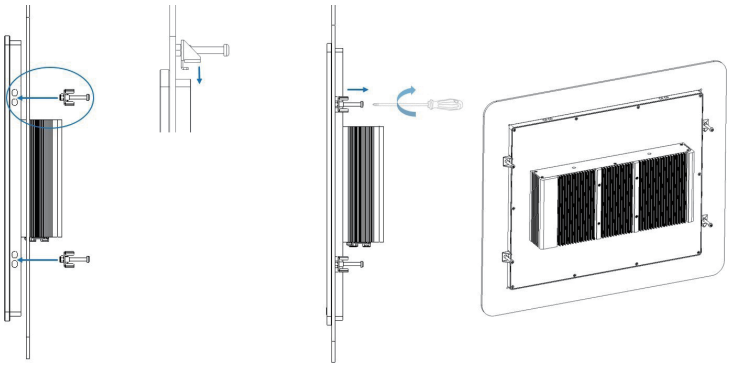
There are different ways to mount the device, including panel mounting, VESA mounting.

4.4.1 Panel Mounting

1. Position the product into the mounting holes.

2. Retrieve the installation buckle 4pcs from the accessory box. Snap the buckle into the side of the product inside the mounting hole. You can adjust the buckle up and down or left and right to suit your application environment.

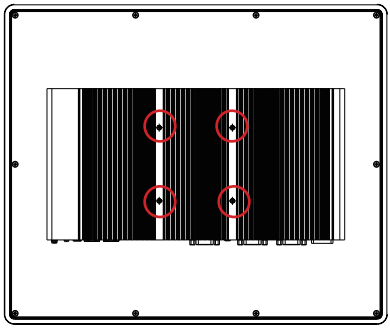
3. Secure the clips, tighten the screws firmly.



4.4.1 Panel Mounting Installation

4.4.2 VESA Mounting

Attach the VESA bracket to the product's 75 x 75mm VESA hole by four screws.



4.4.2 VESA Mounting Installation

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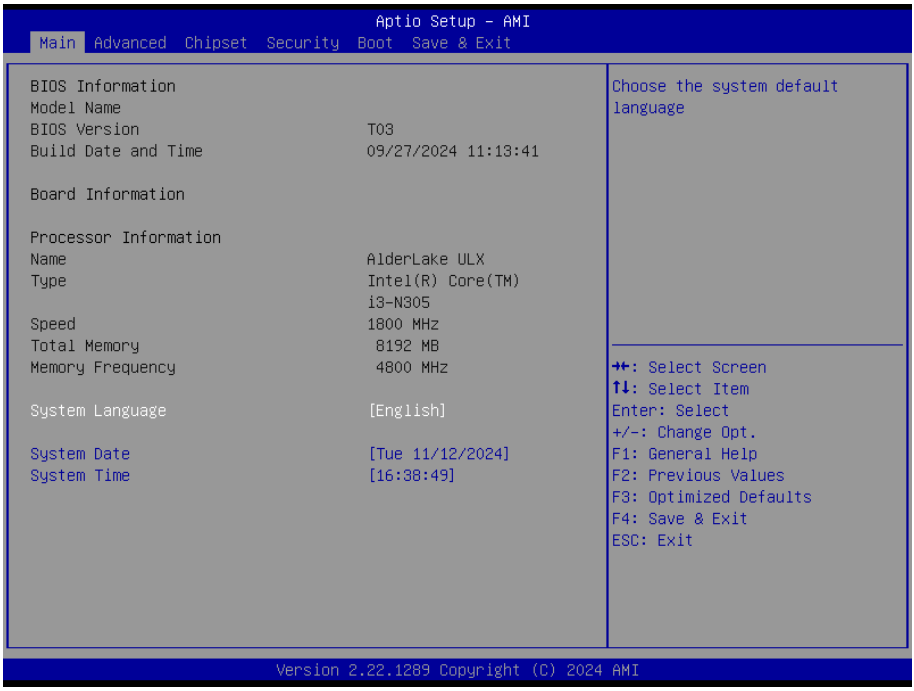
Chapter 5

BIOS

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

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



Note: Actual model name and board information varies according to your model.

Key Commands

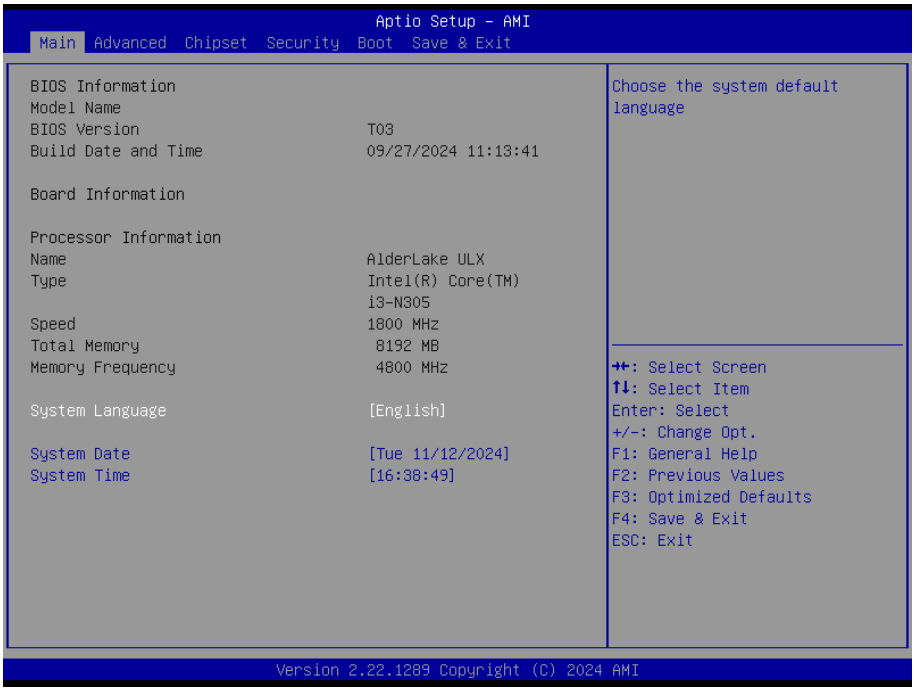
The BIOS Setup utility relies on a keyboard to receive user's instructions. Hit the following keys to navigate within the utility and use the utility.

Keystroke	Function	Scenes
F7	Enter the boot up sequence menu	**After System is powered ON**
DEL	Enter the BIOS menu	
Ctrl + Alt + DEL	Restart the system	
← →	Moves left/right between the top menus.	**In BIOS**
↓ ↑	Moves up/down between highlight items.	
Enter	Selects an highlighted item/field.	
Page Up / +	Increases current value to the next higher value or switches between available options.	
Page Down / -	Decreases current value to the next lower value or switches between available options.	
F3	Load defaults	
F4	Save the Settings and Quit the BIOS	
Esc	► On the top menus: Use **Esc** to quit the utility without saving changes to CMOS. (The screen will prompt a message asking you to select **OK** or **Cancel** to exit discarding changes. ► On the submenus: Use **Esc** to quit current screen and return to the top menu.	

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

5.1. Main - Sets system Time & Date.

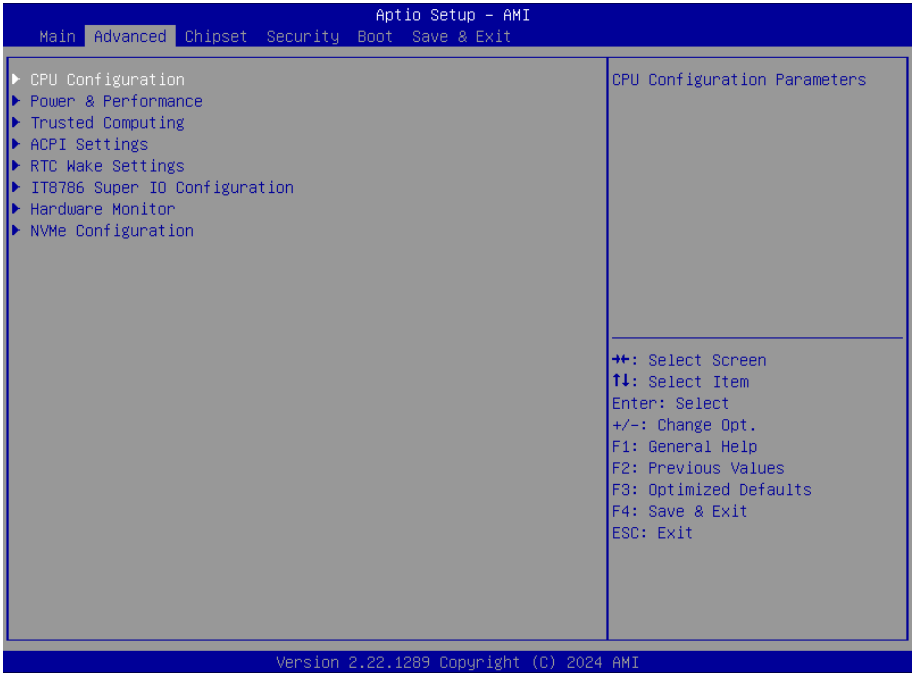
The **Main** menu features the settings of **System Date** and **System Time** and displays some BIOS info.



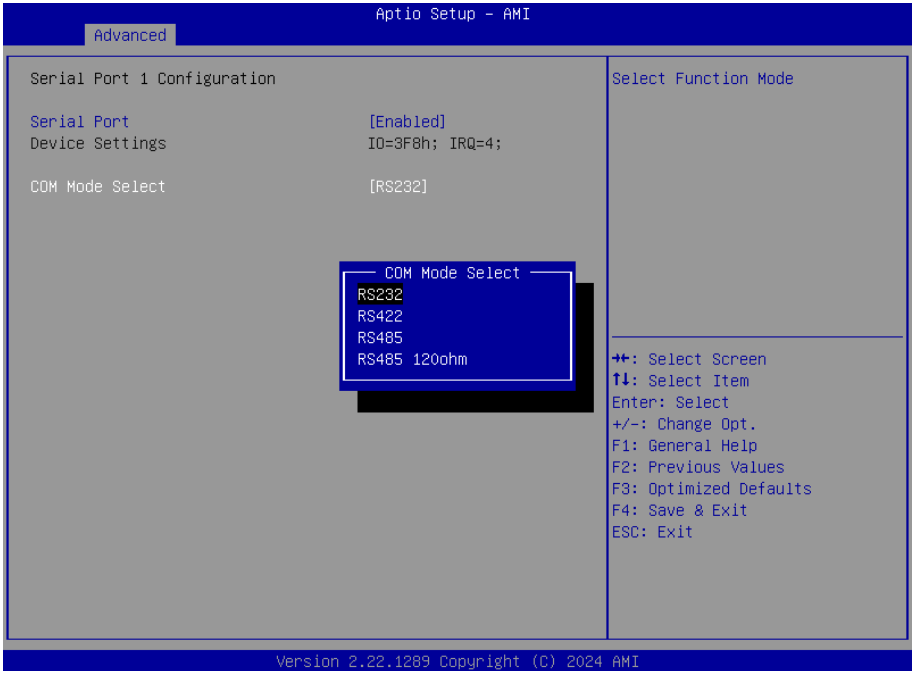
Note: Actual model name and board information varies according to your model.

Setting	Description
System Date	Sets system date.
System Time	Sets system time.

5.2. Advanced

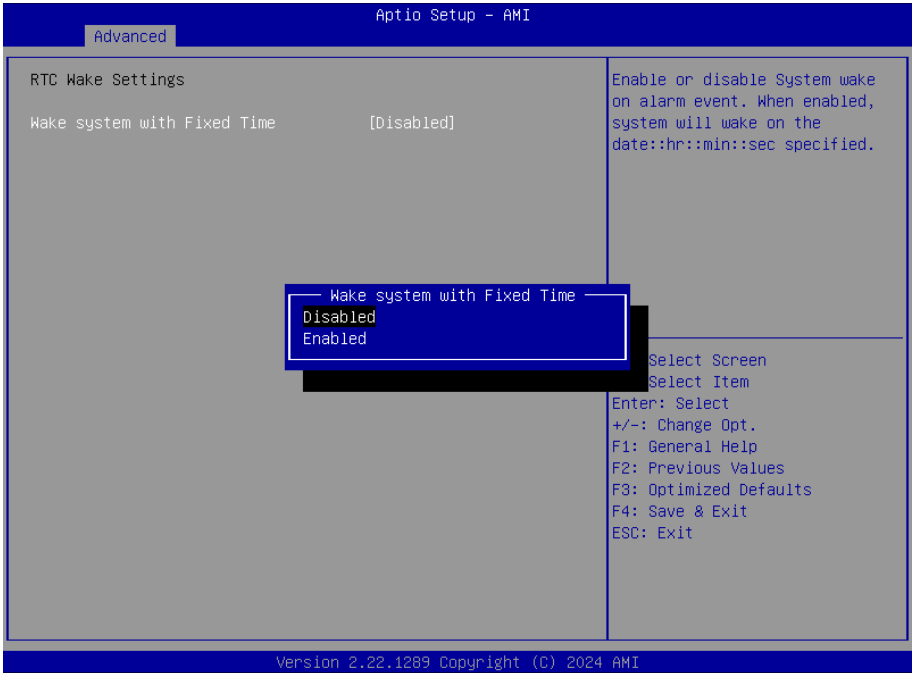

Aptio Setup – AMI
Main Advanced Chipset Security Boot Save & Exit
CPU Configuration
Power & Performance
Trusted Computing
ACPI Settings
RTC Wake Settings
IT8786 Super IO Configuration
Hardware Monitor
NVMe Configuration
CPU Configuration Parameters
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1289 Copyright (C) 2024 AMI

5.2.1. COM Mode Setting



Enter Advanced menu, select "**IT8786 Super IO Configuration**" -> "**Serial Port X Configuration**" -> "**COM Mode Select**". Users can select RS232, RS422, RS485 for COM mode setting. After setting, press F4 to save and exit, the system will take effect after reboot.

5.2.2. Wake System with Fixed time



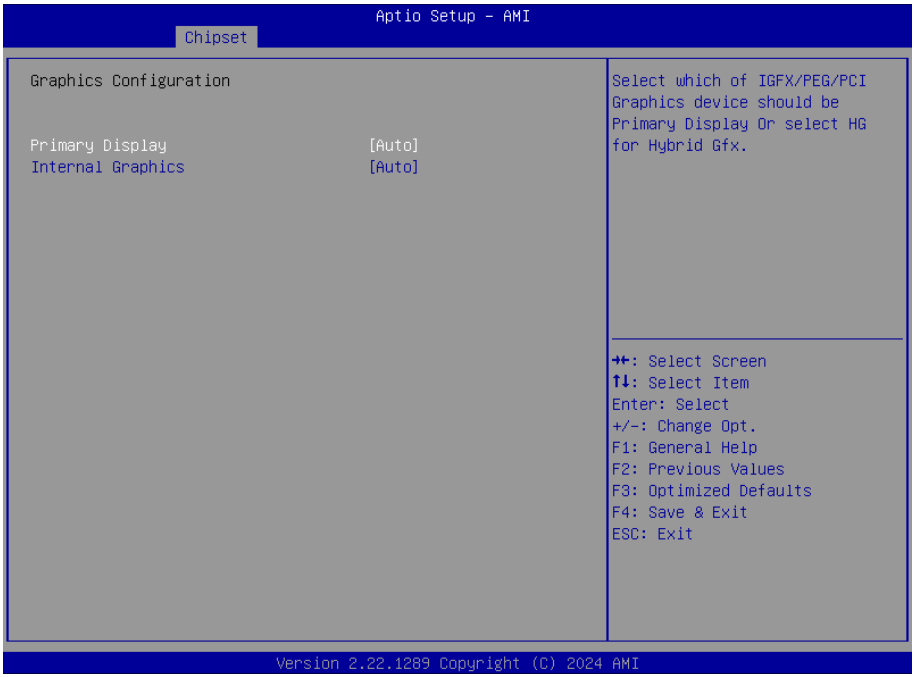
Enter Advanced menu, select "**RTC Wake Settings**" -> "**Wake system with Fixed Time**", and select Enabled, you can select fixed date/time to wake the system.

Setting	Description
Wake System with Fixed Time	**Enable** or **Disable** (default) system wake on alarm event. ▶ Options available are: **Disabled** (default): **Enabled:** System will wake on the hr::min::sec specified.

5.3 Chipset Menu

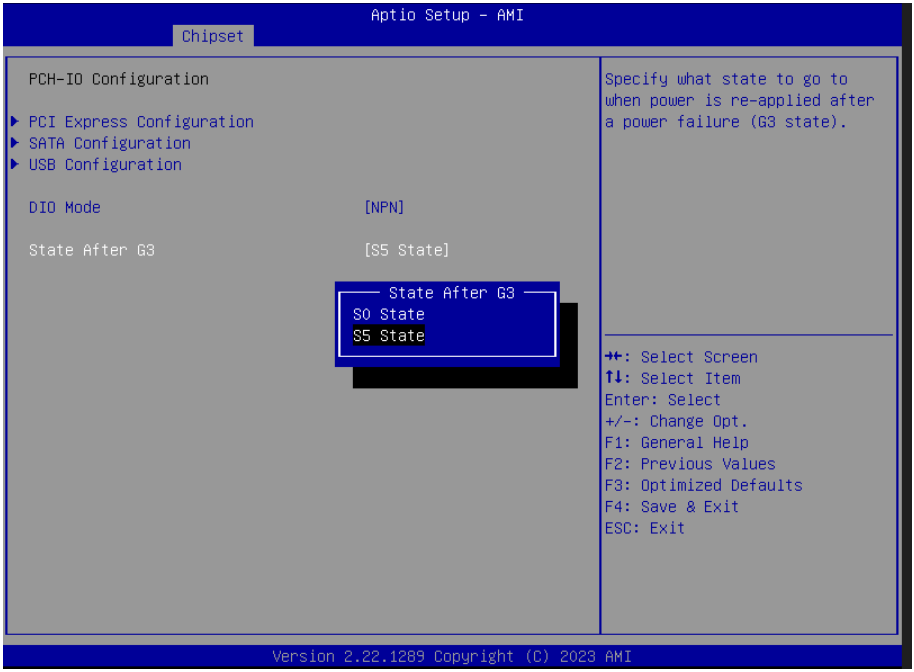
Use the keyboard arrow keys to move to the Chipset option. The submenu has detailed option descriptions.

5.3.1 Graphics Configuration



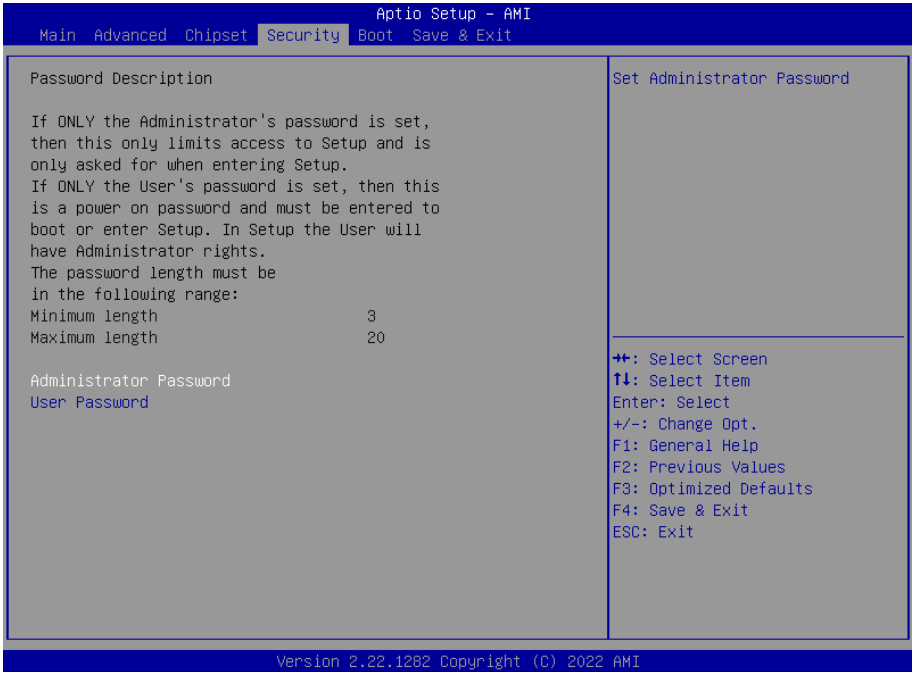
Enter the **Chipset** interface, select **System Agent (SA) Configuration->Graphics Configuration**, and set it to **Auto**. The resolution/bits of the LCD screen and other related display parameters will be adaptive. After the settings are completed, press F4 to save and exit, and the settings will take effect after the system is rebooted.

5.3.2 AT/ATX Mode



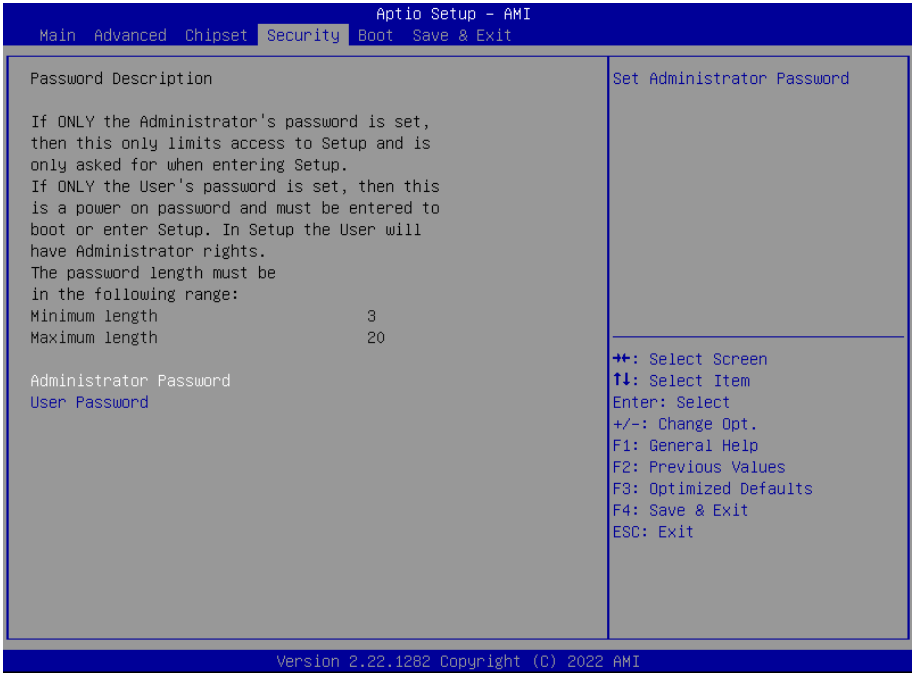
Enter the **"Chipset"** interface, then select **PCH-IO Configuration** -> **State After G3**. Users can select **"S0 State/S5 State"** for power mode on the system. **"S0 State"** is AT mode, it will power on the system automatically after connecting the power supply, and S5 State is ATX mode. Users need to press the power button to turn on the system after connecting the power supply. **"S5 State"** is ATX mode. After connecting the power supply, you need to press the power button to power up the device. After setting, press F4 to save and exit, the system will take effect after reboot.

5.4 Security



Use the keyboard arrow keys to move to the Security option. The submenu has detailed option descriptions, including security settings. Administrator and user passwords can be set to protect the computer from infringement.

5.4.1 Administrator & User Password



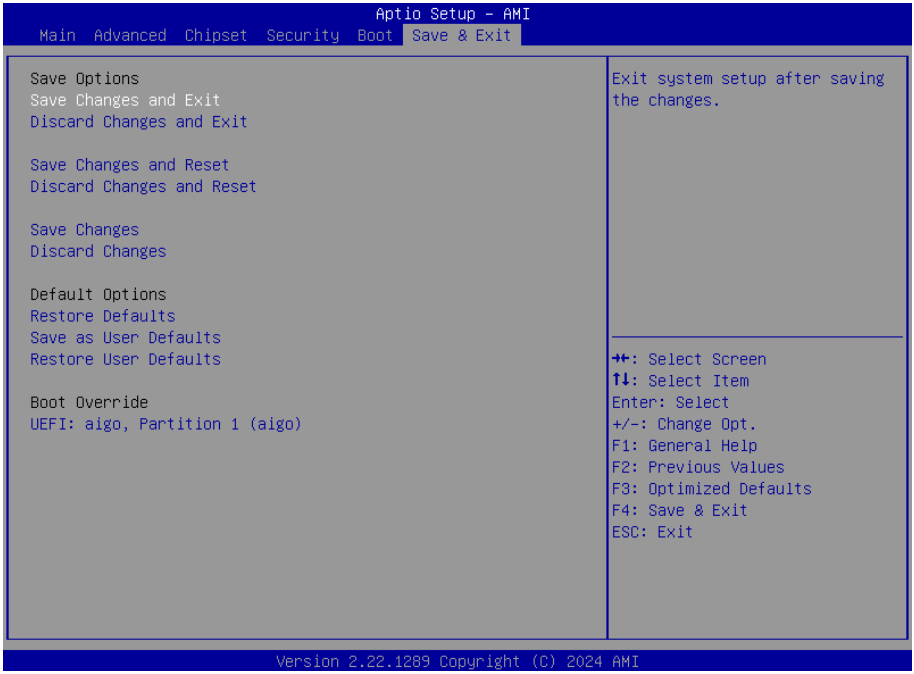
Setting	Description
Administrator Password	To set up an administrator password: 1. Select **Administrator Password**. 2. An **Create New Password** dialog then pops up onscreen. 3. Enter your desired password that is no less than 3 characters and no more than 20 characters. 4. Press [Enter] key to submit.
User Password	To set up user password: 1. Select **User Password**. 2. An **Create New Password** dialog then pops up onscreen. 3. Enter your desired password that is no less than 3 characters and no more than 20 characters. 4. Press [Enter] key to submit.

5.5. Boot

Use the keyboard arrow keys to move to the Boot option. The submenu has detailed option descriptions, including the following boot settings. You can select the order of boot devices, etc.

Setting	Description
Bootup NumLock State	Set NumLock to be on or off at boot time.
Quiet Boot	Select "Enable" to display the logo screen at startup. Select "Disable" to turn off the startup logo.
Boot Option Priority	Set the system boot priorities. Users can set the order of boot devices. Boot Option #1 is the first priority boot item, Boot Option #2 is the second boot item, and so on. Press F4 to save and exit, the system will take effect after reboot.

5.6. Save & Exit



Use the keyboard arrow keys to move to the Save & Exit option, a submenu with detailed option descriptions showing how to exit the BIOS Setup Utility. When you complete the settings, you must save and exit for the changes to take effect.

Setting	Description
Save Changes and Reset	Save the changes and then restart the system.
Discard Changes and Reset	Discard the changes and restart the system.
Restore Defaults	Restore default values.
Boot Override	Set boot device priority.