



User Manual

BPCWL02 / BPCWL03

BPCEL02 / BPCEL03 / BPCEL07

BPCAL02 / BPCAL03

BPCAR02 / BPCAR03

BPCRL02 / BPCRL03

Notice

The illustrations in this user's manual are for reference only.
Actual product specifications may vary with territories.

The information in this user's manual is subject to change without notice.

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(WEEE) regulations, visit
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■ 1.1 Regulations information

- FCC rules

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.

- CAN ICES-003(B) / NMB-003(B)

- CE compliance

This device is classed as a technical information equipment (ITE) in class A and is intended for use in commercial, transport, retailer, public, automation...field.

**WARNING**

THIS PRODUCT CONTAINS A BUTTON BATTERY

If swallowed, a lithium button battery can cause severe or fatal injuries within 2 hours. Keep batteries out of reach of children.

If you think batteries may have been swallowed or placed inside any part of the body, seek immediate medical attention.



CAUTION: This product is intended for exclusive use and will not be used in places where children may come into contact with it.



CAUTION: Any changes or modifications not expressly approved by the guarantee of this device could void the user's authority to operate the equipment.

■ 1.2 Safety instructions

The following safety precautions will increase the life of the Box-PC.

Follow all Precautions and instructions.

Do not place this device underneath heavy loads or in an unstable position.

Do not use or expose this device around magnetic fields as magnetic interference may affect the performance of the device.

Do not expose this device to high levels of direct sunlight, high-humidity or wet conditions.

Do not block the air vents to this device or impede the airflow in any way.

Do not expose to or use near liquid, rain, or moisture.

Do not use the modem during electrical storms.

· BPCWL02, BPCEL02, BPCAL02, BPCAR02, BPCRL02:

The unit can be operated at an ambient temperature of max. 40°C (104°F).

Do not expose it to temperatures below 0°C (32°F) or above 40°C (104°F).

· BPCWL03, BPCEL03, BPCAL03, BPCAR03, BPCRL03:

The unit can be operated at an ambient temperature of max. 60°C (140°F).

Do not expose it to temperatures below -20°C (-4°F) or above 60°C (140°F).

Ideal for industrial applications: factory, engine room... etc. Touching of Box-PC in operation at a temperature range of -20°C (-4°F) and 60°C (140°F) must be avoided.

· BPCEL07:

The unit can be operated at an ambient temperature of max. 70°C (158°F).

Do not expose it to temperatures below -30°C (-22°F) or above 70°C (158°F).

Ideal for industrial applications: factory, engine room... etc. Touching of Box-PC in operation at a temperature range of -30°C (-22°F) and 70°C (158°F) must be avoided.



Caution high surface temperature!

Please don't touch the set directly till the set cool down.



CAUTION: Incorrectly replacing the battery may damage this computer. Replace only with the same or equivalent as recommended by manufacturer. Dispose of used batteries in accordance with the laws of your country.

■ 1.2 Consignes de sécurité

Les mesures de précaution suivantes servent à prolonger la durée de vie de l'ordinateur. Par conséquent, veuillez observer l'ensemble des mesures de précaution et des instructions.

Ne pas poser d'objets lourds sur l'appareil ou ne pas le mettre pas dans une position instable.

Ne pas exposer l'appareil à de forts champs magnétiques, puisque cela pourrait causer des interférences.

Ne pas exposer l'appareil directement aux rayons du soleil, à l'humidité ou ne pas le placer dans un endroit humide.

Ne pas couvrir la fente d'aération de l'appareil ou ne pas empêcher la circulation d'air de quelque sorte que ce soit.

Ne pas utiliser l'appareil à proximité de liquides, de pluie ou d'humidité.
Ne pas utiliser le modem pendant un orage.

· BPCWL02, BPCEL02, BPCAL02, BPCAR02, BPCRL02: L'appareil peut être utilisé à une température ambiante maximum de 40°C (104°F). Ne pas exposer l'appareil à une température inférieure à 0°C (32°F) ou supérieure à 40°C (104°F).

· BPCWL03, BPCEL03, BPCAL03, BPCAR03, BPCRL03:
L'appareil peut être utilisé à une température ambiante maximum de 60°C (140°F). Ne pas exposer l'appareil à une température inférieure à -20°C (-4°F) ou supérieure à 60°C (140°F). Idéal pour les applications industrielles: usine, salle des machines, etc. Le contact direct avec le PC Box pendant le fonctionnement dans la plage de température étendue -20°C (-4°F) - 60°C (140°F) doit être évité.

· BPCEL07: L'appareil peut être utilisé à une température ambiante maximum de 70°C (158°F). Ne pas exposer l'appareil à une température inférieure à -30°C (-22°F) ou supérieure à 70°C (158°F). Idéal pour les applications industrielles: usine, salle des machines, etc. Le contact direct avec le PC Box pendant le fonctionnement dans la plage de température étendue -30°C (-22°F) - 70°C (158°F) doit être évité.



Attention : température de surface élevée !

Ne touchez pas l'appareil avant qu'il n'ait refroidi.



ATTENTION : Ne pas replacer correctement la pile peut endommager l'ordinateur. Remplacez-la uniquement par un modèle identique ou un équivalent comme recommandé par fabricant. Éliminez les piles usagées conformément à la législation en vigueur dans votre pays.

■ 1.3 Notes for this manual



CAUTION! Important information that must be followed for safe operation.



NOTE: Information for special situations.

■ 1.4 Release history

Version	Revision note	Date
1.0	First released	10.2023

Getting to know the basics

■ 2.1 Product specification

This User's Manual provides instructions and illustrations on how to operate this Box-PC. It is recommended to read this manual carefully before using this Box-PC.



NOTE: The product's color, I/O port, indicator location, and specification will depend upon the actually shipped product.

System		
Processor	BPCWL02 BPCWL03	8th Gen. Intel® Whiskey Lake-U series Processors – Intel® Core™ i7-8665UE vPro Intel® Core™ i7-8565U Intel® Core™ i5-8365UE vPro Intel® Core™ i5-8265U Intel® Core™ i3-8145UE Intel® Celeron 4305UE
	BPCEL02 BPCEL03 BPCEL07	Intel® Elkhart Lake CPU, Atom® x6425E, 4 Core, 1.5M Cache, 2.0GHz (3.0GHz), 12W (optional) Pentium® J6426, 4 Core, 1.5M Cache, 2.0GHz (3.0GHz), 10W (optional) Celeron® J6412, 4 Core, 1.5M Cache, 2.0GHz (2.6GHz), 10W (optional)
	BPCAL02 BPCAL03	12th Gen. Intel® Alder Lake-U series Processors – Intel® Core™ i7-1265UE vPro Intel® Core™ i7-1255U vPro Intel® Core™ i5-1245UE vPro Intel® Core™ i5-1235U vPro Intel® Core™ i3-1215UE Intel® Core™ i3-1215U Intel® Celeron 7305E
	BPCAR02 BPCAR03	15th Gen. Intel® Arrow Lake Processors – Intel® Core™ Ultra 5 225U Intel® Core™ Ultra 5 235U vPro Intel® Core™ Ultra 7 255U Intel® Core™ Ultra 7 265U vPro

System		
Processor	BPCRL02 BPCRL03	13th Gen. Intel® Raptor Lake series Processors – Intel® Core™ i7-1365UE Intel® Core™ i7-1355U Intel® Core™ i5-1345UE Intel® Core™ i5-1335U Intel® Core™ i3-1315UE Intel® Core™ i3-1315U Intel® Processor U300 Intel® Core™ 5-120U Intel® Core™ 7-150U
Memory	BPCWL02, BPCWL03 : 2 x 260 pin SO-DIMM up to 64GB, Dual Channel 1.2 V DDR4 2400MHz	
	BPCEL02, BPCEL03, BPCEL07: 2 x 260 pin SO-DIMM up to 32GB, Dual Channel 1.2 V DDR4 3200MHz	
	BPCAL02, BPCAL03, BPCAR02, BPCAR03, BPCRL02, BPCRL03: 2 x 262 pin SO-DIMM up to 64GB, Dual Channel 1.1 V DDR5 5600MHz	
Storage		
Internal	1 x M.2 2280 M key (PCIe NVMe / SATA)	
Audio		
	BPCWL02 BPCWL03	2 x HDMI 1.4b: 4096 x 2160@30Hz Supports dual displays
	BPCEL02, BPCEL03 BPCEL07	2 x HDMI 2.0b: 4096 x 2160@60Hz Supports dual displays
	BPCAL02, BPCAL03 BPCRL02, BPCRL03	2 x HDMI 2.0: 4096 x 2160@60Hz Supports dual displays
	BPCAR02, BPCAR03	1 x HDMI 2.1: 7680 x 4320@60Hz 2 x HDMI 2.0b: 4096 x 2160@60Hz (optional) Supports dual displays

Storage	
Internal	1 x M.2 2280 M key (PCIe NVMe / SATA)
Audio	
Audio Codec	<ul style="list-style-type: none"> · BPCWL02, BPCWL03: Realtek ALC662/ALC888S 2-channel · BPCEL02, BPCEL03, BPCEL07, BPCAL02, BPCAL03, BPCAR02, BPCAR03, BPCRL02, BPCRL03: C888S-VD 2 CH HD audio
Network	
Ethernet	<ul style="list-style-type: none"> · BPCWL02, BPCWL03: 2 x Intel® Gigabit LAN · BPCEL02, BPCEL03, BPCEL07, BPCAL02, BPCAL03, BPCAR02, BPCAR03, BPCRL02, BPCRL03: 2 x Intel® 2.5G LAN
WLAN	<p>Intel WiFi Module (802.11 a/b/g/n/ac) & BT 5.0 (Option)</p> <p>Realtek RTL8821CE 802.11a/b/g/n/ac + Bluetooth 4.2 WLAN card M.2 2230 E key (Option)</p> <p>External antenna (Dipole) x2 (Option)</p>
I/O Interface	
LAN	<ul style="list-style-type: none"> · BPCWL02, BPCWL03: 2 x RJ-45 (10/100/1000Mbps), Supports Wake On LAN · BPCEL02, BPCEL03, BPCEL07, BPCAL02, BPCAL03, BPCAR02, BPCAR03, BPCRL02, BPCRL03: 2 x RJ-45 (10/100/1000Mbps/2.5GbE) Supports Wake On LAN, Teaming Mode
Serial Ports	<p>1 x RS-232 (DB-9)</p> <p>2 x RS-232/422/485 (DB-9) (RS232 with power supply : ring in/ 5V (standard) & 12V (with specific optional board))</p>
USB	<p>4 x USB2.0</p> <ul style="list-style-type: none"> · BPCWL02, BPCWL03, BPCEL02, BPCEL03, BPCEL07: 4 x USB3.2 Gen 1 (Type A) · BPCAL02, BPCAL03, BPCAR02, BPCAR03, BPCRL02, BPCRL03: 4 x USB3.2 Gen 2 (Type A)
Audio	1 x Line-out, 1 x Mic-in

Power	
Type	<ol style="list-style-type: none"> 1. 19V (without wide range board) 2. With wide range board, MB support 9-36V DC-in
Adapter	<ul style="list-style-type: none"> · BPCWL02, BPCEL02, BPCAL02, BPCAR02, BPCRL02: 19V/4.74A 90W external adapter · BPCWL03, BPCEL03, BPCEL07, BPCAL03, BPCAR03, BPCRL03: 19V/7.89A 150W external adapter
Watchdog Timer	
OS Support	<ul style="list-style-type: none"> · BPCWL02, BPCWL03: Windows 10/11 Embedded 64bit, Linux 64bit · BPCEL02, BPCEL03, BPCEL07: Windows 11 OS / Linux (base on Elkhart Lake Atom support OS) · BPCAL02, BPCAL03: Windows 11 OS / Linux (base on Alder Lake support OS) · BPCRL02, BPCRL03: Windows 11 IoT 64bit O.S / Linux (base on Raptor Lake support OS) · BPCAR02, BPCAR03: Windows 11 IoT 64bit O.S / Linux (base on Arrow Lake supported OS)
Mechanism	
Mounting	<p>VESA Mount 75 x 75 mm</p> <p>Ear Mount 256 x 100 mm</p> <p>Din Rail</p>
Dimension	(W) 245mm x (H) 57mm x (D) 169mm
Weight	2.85kg
BIOS	AMI UEFI 64 Mbit

Environment	
Operating Temperature	<ul style="list-style-type: none"> · BPCWL02, BPCEL02, BPCAL02, BPCAR02, BPCRL02: 0 ~ 40°C · BPCWL03, BPCEL03, BPCAL03, BPCAR03, BPCRL03: -20 ~ 60°C · BPCEL07: -30 ~ 70°C
Relative Humidity	20% - 80% RH (non-condensing)
EMC	<ul style="list-style-type: none"> · BPCWL02, BPCEL02, BPCEL03, BPCEL07, BPCAL02, BPCAL03: CE, FCC, VCCI, RCM, BSMI · BPCAR02, BPCAR03, BPCRL02, BPCRL03: CE, FCC, VCCI, RCM, BSMI, UKCA · BPCWL03: CE, FCC, VCCI, RCM
Safety	<ul style="list-style-type: none"> · BPCWL02, BPCEL02, BPCEL03, BPCEL07, BPCAL02, BPCAL03: cTUVus, CB, BSMI · BPCAR02, BPCAR03, BPCRL02, BPCRL03: cTUVus, CB, BSMI, UKCA · BPCWL03: cTUVus, CB



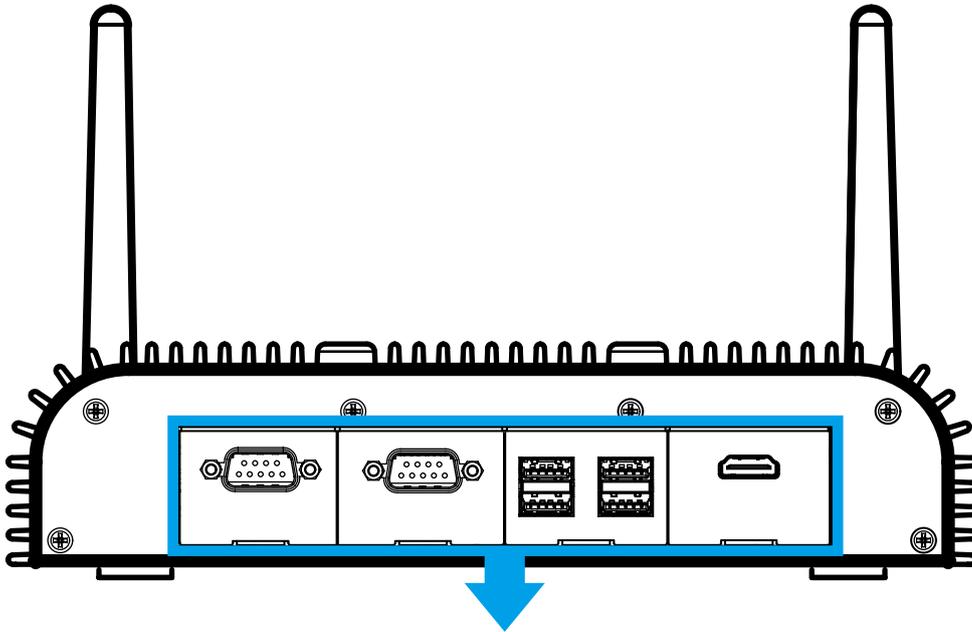
CAUTION! MODEL BPCWL02/ BPCEL02/ BPCAL02/ BPCAR02/ BPCRL02 IS DESIGNED TO USE WITH THE DC INPUT: (19Vdc / 4.74A) ADAPTERS.

MODEL BPCWL03/ BPCEL03/ BPCEL07/ BPCAL03/ BPCAR03/ BPCRL03 IS DESIGNED TO USE WITH THE DC INPUT: (19Vdc / 7.89A) ADAPTERS.

Adapter watt should follow default setting or refer to rating label information.

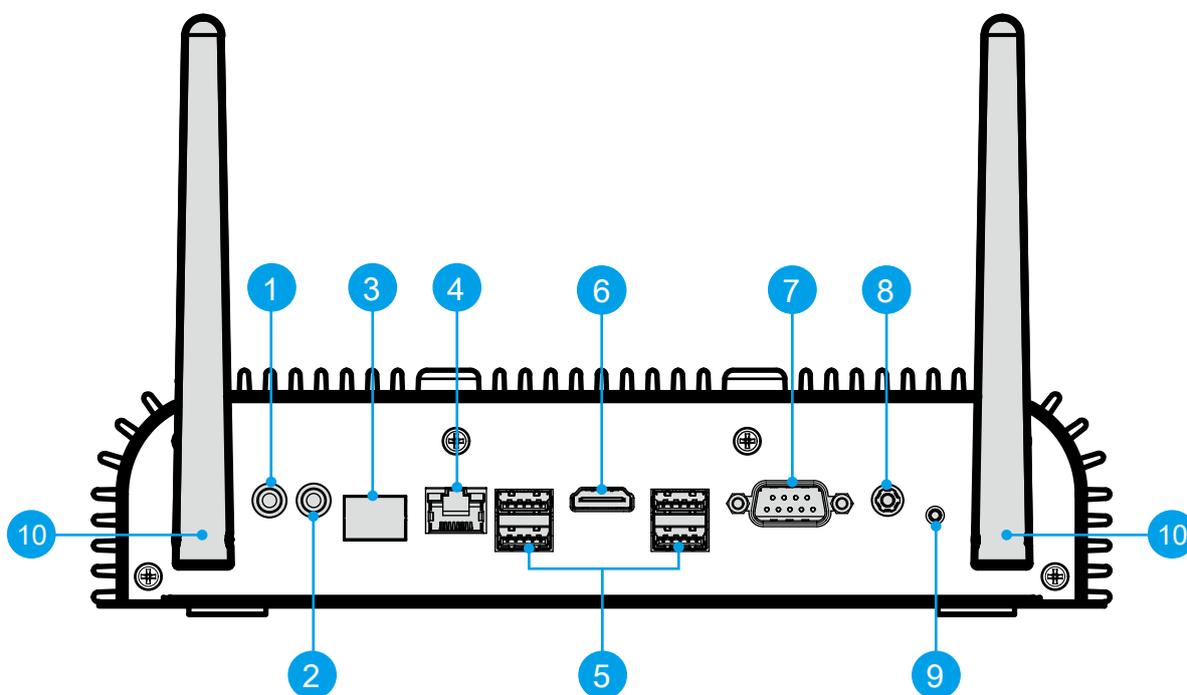
2.2 Product overview

- Front Panel: Optional I/O ports are available depending on the specs of the actually shipped product.



Optional I/O Port	Occupied Sections	Specifications / Limitations
HDMI	1	Choose one from four optional display boards. Max. resolution: 1. HDMI 1.4: 4k/30Hz 2. HDMI 2.0: 4k/60Hz 3. DisplayPort: 4k/60Hz 4. DVI-I/D-Sub: 1920x1080
DisplayPort 1.2 (DP)	1	
D-Sub (VGA)	1	
DVI-I (Single Link)	1	
USB 2.0	1	Maximum: 2 x Quad USB 2.0 board
COM4	1	RS232 only
COM2, COM3	2	RS232 / RS422 / RS485 Power supply : Ring in/5V

- Back Panel: Refer to the following illustration to identify the components on this side of the Box-PC. Features and configurations vary by model.



- 1 Headphones / Line-out jack
- 2 Microphone jack
- 3 LAN port (supports wake on LAN)(optional)
- 4 LAN port (supports wake on LAN)
- 5 · BPCWL02, BPCWL03, BPCEL02, BPCEL03, BPCEL07:
USB3.2 Gen 1 (Type A)
· BPCAL02, BPCAL03: USB3.2 Gen 2 (Type A)
- 6 HDMI port
- 7 COM port (RS232 only)
- 8 Power jack (DC-IN)
- 9 Power button
- 10 Connector for WLAN Dipole antennas (optional)

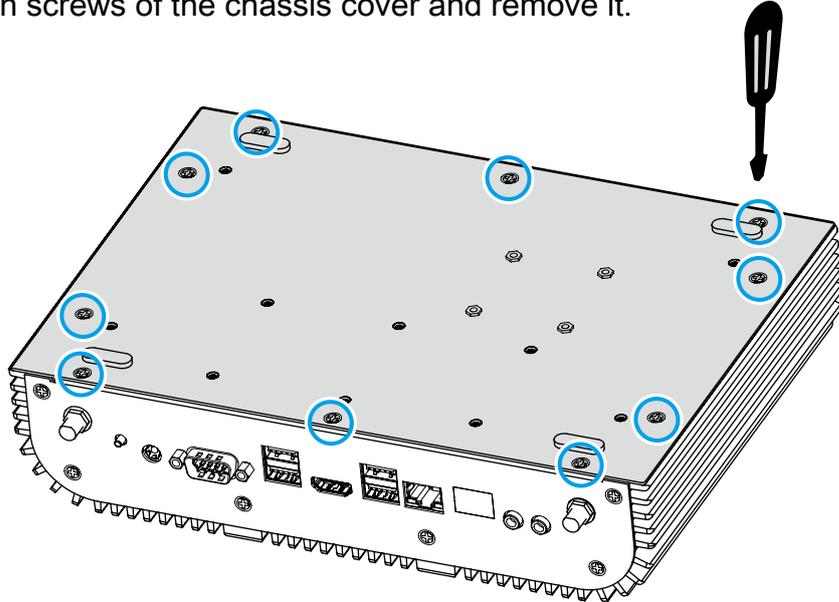
Hardware Installation

3.1 Begin Installation

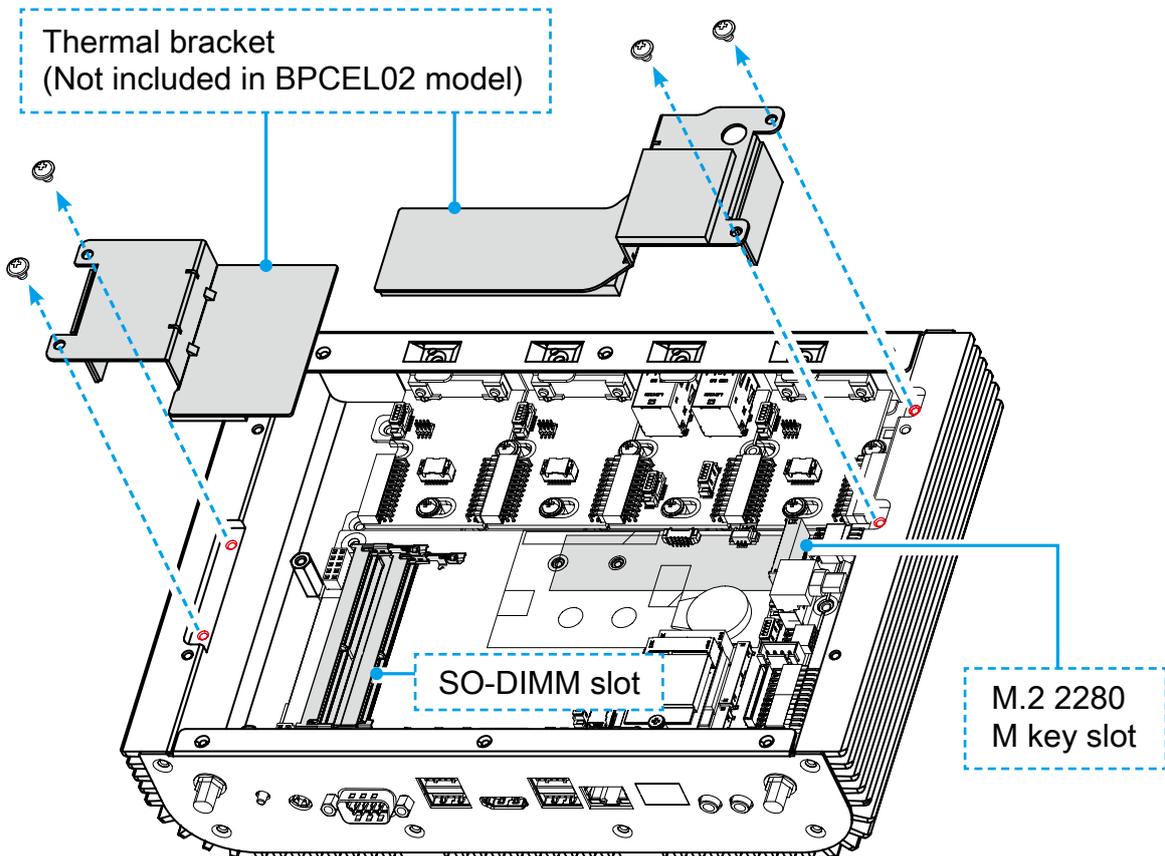


CAUTION! For safety reasons, please ensure that the power cord is disconnected before opening the case.

1. Unscrew the ten screws of the chassis cover and remove it.



2. Unfasten the thermal bracket mount screws and remove the two thermal brackets.



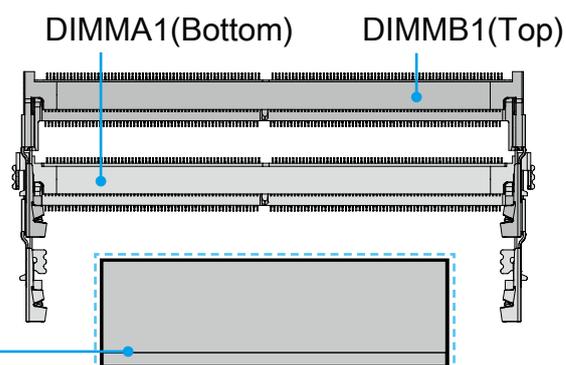
3.2 Memory Module Installation

BPCWL02, BPCWL03	2 x 260 pin SO-DIMM up to 64GB, Dual Channel 1.2 V DDR4 2400MHz
BPCEL02, BPCEL03, BPCEL07	2 x 260 pin SO-DIMM up to 32GB, Dual Channel 1.2 V DDR4 3200MHz
BPCAL02, BPCAL03, BPCAR02 BPCAR03, BPCRL02, BPCRL03	2 x 262 pin SO-DIMM up to 64GB, Dual Channel 1.1 V DDR5 5600MHz

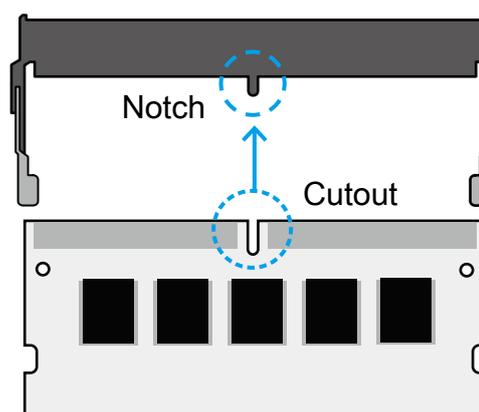
1. Locate the SO-DIMM and paste the thermal pad on the motherboard, which can effectively reduce its temperature. (Not included in BPCWL02, BPCWL03, BPCEL02 model)

2. Install the 1st memory module into the DIMMA1 slot.

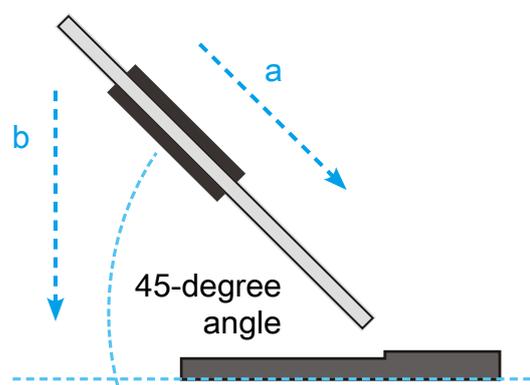
BPCEL03, BPCEL07, BPCAL02, BPCAL03, BPCAR02, BPCAR03, BPCRL02, BPCRL03 (with thermal pad *1)



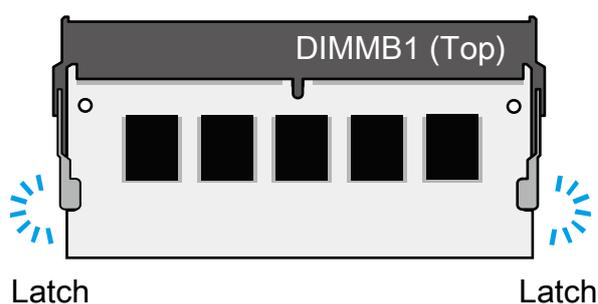
3. Align the notch of the memory module with the one of the relevant memory slot.



4. Gently insert the module into the slot in a 45-degree angle.
5. Carefully push down the memory module until it snaps into the locking mechanism.



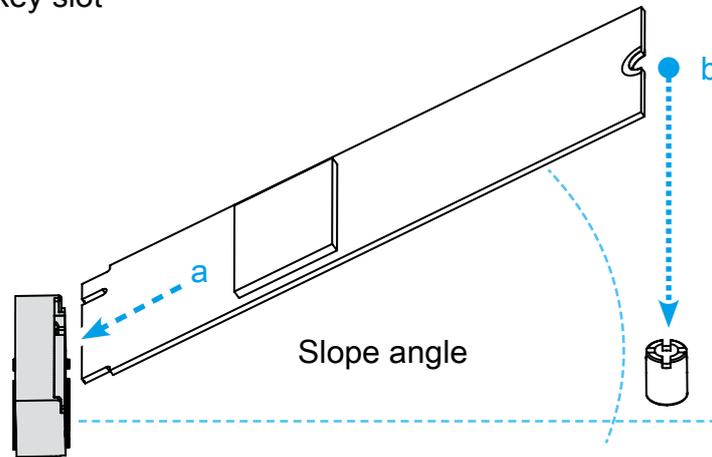
6. Install the 2nd memory module into the DIMMB1 slot (proceed with steps B3 to B5).



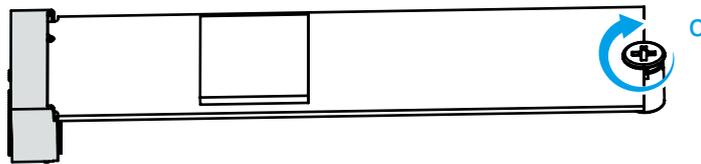
3.3 M.2 Device Installation

1. Locate the M.2 key slots on the motherboard, unfasten the screw first.

➤ M.2 2280 M key slot

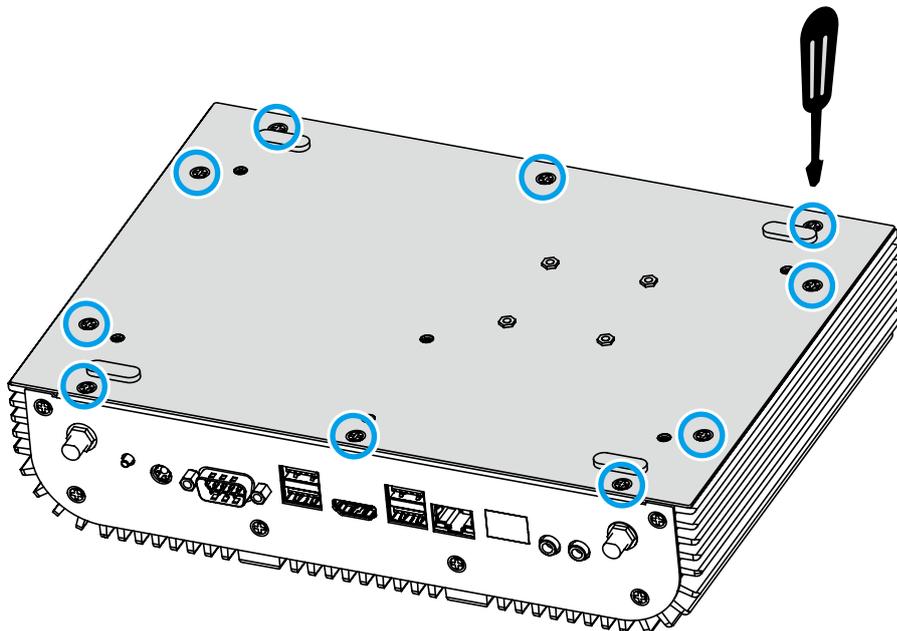


2. Install the M.2 device into the M.2 slot and secure with the screw.



3. Place and refasten the two thermal brackets in the chassis with four screws.

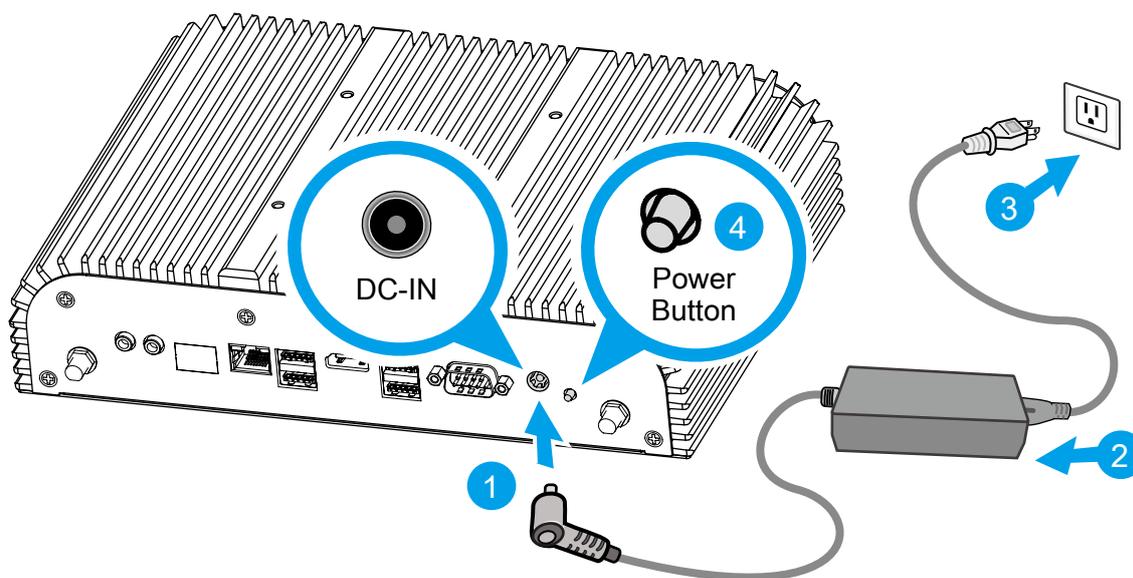
4. Please replace and affix the chassis cover with ten screws.



■ 3.4 Powering on the system

- Follow the steps (1-3) below to connect the AC adapter to the power jack (DC-IN). .Press the power button (4) to turn on the system.

 NOTE: Press and hold the power button for 5 seconds to force shutdown.

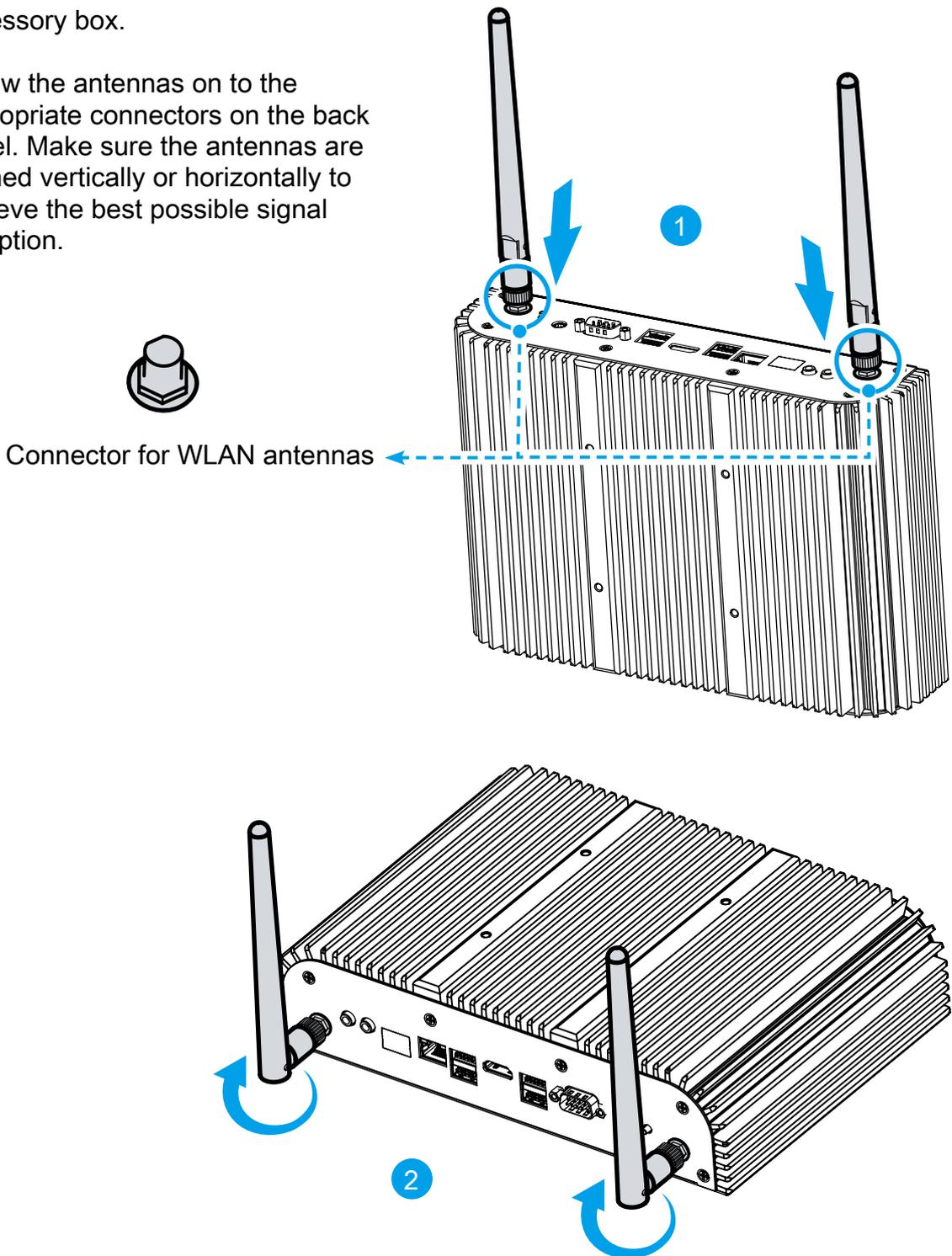


 **CAUTION:** Do not use inferior extension cords as this may result in damage to your Box-PC. The Box-PC comes with its own AC adapter. Do not use a different adapter to power the Box-PC and other electrical devices.

 NOTE: The power adapter may become warm to hot when in use. Be sure not to cover the adapter and keep it away from your body.

■ 3.5 Installation of WLAN antennas (optional)

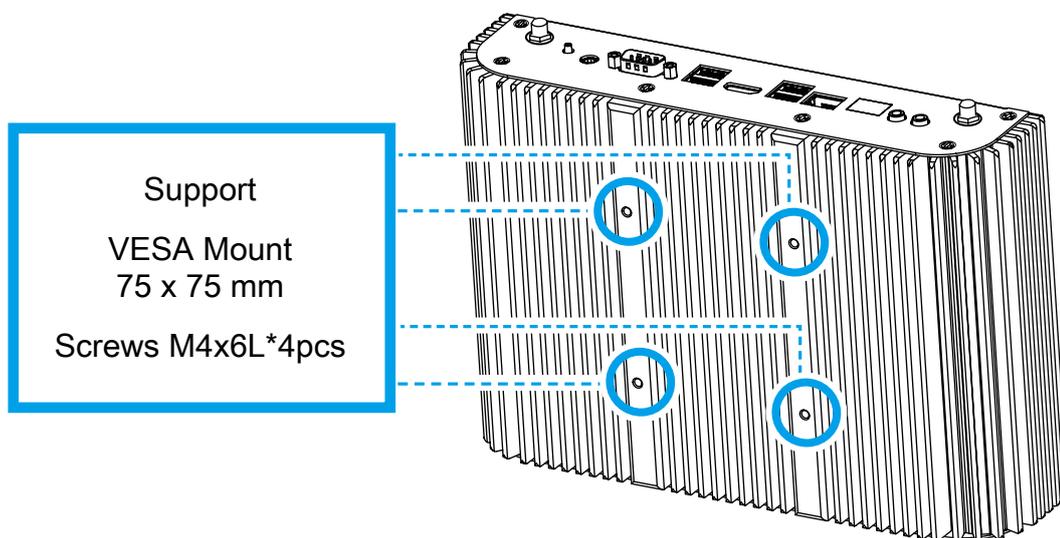
1. Take the two antennas out of the accessory box.
2. Screw the antennas on to the appropriate connectors on the back panel. Make sure the antennas are aligned vertically or horizontally to achieve the best possible signal reception.



CAUTION: Make sure the two antennas are aligned in the correct direction.

■ 3.6 VESA mounting it to the wall (optional)

The standard VESA openings show where an arm/wall mount kit which is available separately can be attached.

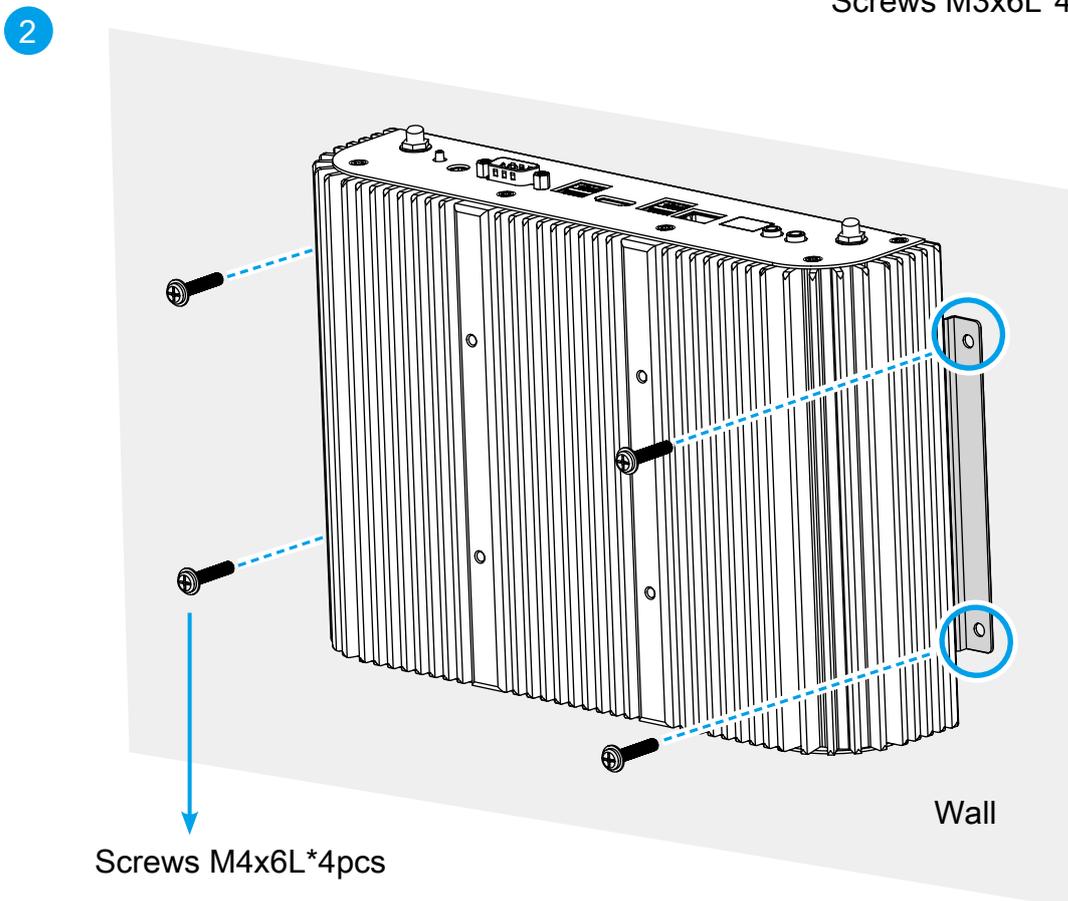
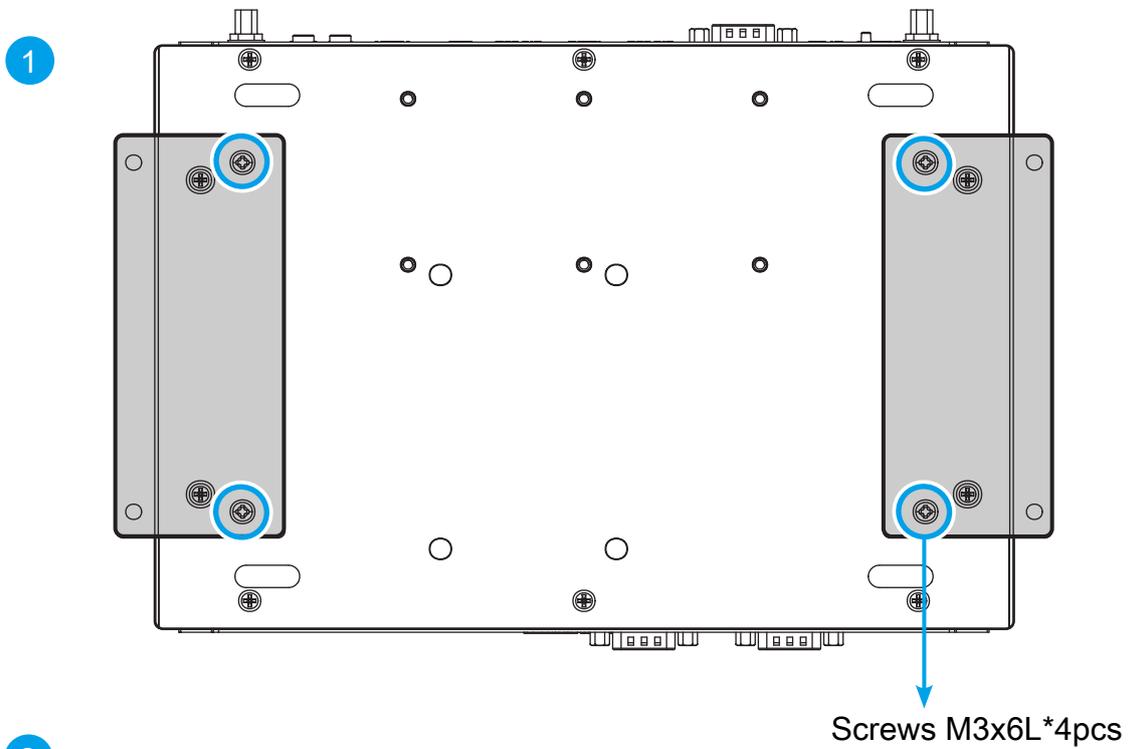


 NOTE: The Box-PC can be wall-mounted using a VESA compatible 75 mm x 75 mm wall/arm bracket. The maximum load capacity is 10 kg and mounting suitable in heights of ≤ 2 m only. The metal thickness of the VESA mount must be between 1.6 and 2.0 mm.

 REMARQUE: Le Box-PC peut être fixé au mur à l'aide d'un support mural / bras compatible VESA 75 mm x 75 mm. La capacité de charge maximale est de 10 kg et le montage convient uniquement à des hauteurs ≤ 2 m. L'épaisseur du support de montage VESA doit être comprise entre 1,6 et 2,0 mm.

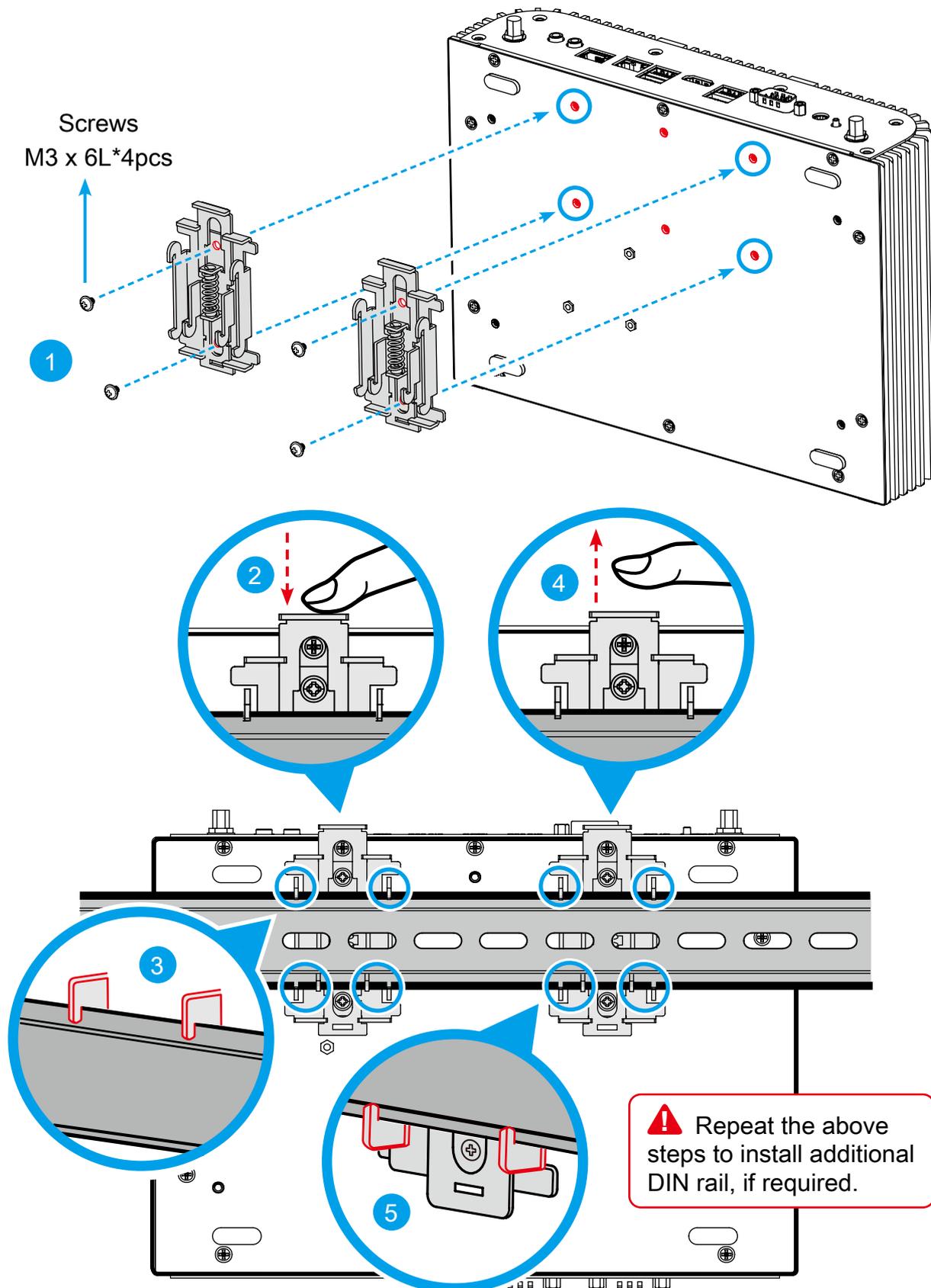
■ 3.7 Ear mounting to the wall (optional)

Follow the steps 1-2 to install the ear mount.



■ 3.8 Using the Din Rail (optional)

Follow the steps 1-5 to affix the Box-PC on a DIN rail.



BIOS Setup

 **NOTE:** Please check your current BIOS version. If your system is not running the latest version, it may pose security risks. Please download and update the BIOS from the **Shuttle official** website.

Please run BIOSCheckerSetup (download the application from the Shuttle website https://image.shuttle.com/ResourceCenter/download_file.jsp?file_id=33992) to detect your BIOS version.

BIOSChecker is Shuttle's automatic support tool that scans your system for BIOS updates and provides download links.

Installing it helps keep your system up to date for best performance.

Steps:

1. Search **BIOSChecker** in the **Start** menu and open it.
2. The tool will automatically check for available updates.
3. If a new version is found, it will show "**New version available**" and provide a link to the Shuttle support site to download the BIOS for your model.

For detailed instructions, visit:

<https://global.shuttle.com/support/faqDetail?faqId=1891>

■ 4.1 About BIOS Setup

The default BIOS (Basic Input/Output System) is already properly configured and optimized, there is normally no need to run this utility.

■ 4.1.1 When to Use BIOS Setup ?

You may need to run the BIOS Setup when:

- An error message appears on the screen during the system booting up and is requested to run SETUP.
- You want to change the default settings for customized features.
- You want to reload the default BIOS settings.



CAUTION! We strongly recommend that you change the BIOS settings only with the help of a trained service personnel.

■ 4.1.2 How to run BIOS Setup ?

To run the BIOS Setup Utility, turn on the Box-PC and press the [Del] or [F2] key during the POST procedure.

If the message disappears before you respond and you still wish to enter Setup, either restart the system by turning it OFF and ON, or simultaneously pressing [Ctrl]+[Alt]+[Del] keys to restart.

The setup function only can be invoked by pressing [Del] or [F2] key during POST that provide an approach to change some setting and configuration the user prefer, and the changed values will save in the NVRAM and will take effect after the system rebooted.

Press [F7] key for Boot Menu.

· When OS support is Windows 11 :

1. Click the "Start  menu" and select "Settings".
2. Select "Windows Update" and Click "Advanced options".
3. Click "Recovery".
4. Under "Advanced startup", click "Restart now".
The system will restart and show the Windows 11 boot menu.
5. Select "Troubleshoot".
6. Choose "Advanced options".
7. Select "UEFI Firmware Settings".
8. Click "Restart" to restart the system and enter UEFI (BIOS).

· When OS support is Windows 10 :

1. Click the "Start  menu" and select "Settings".
2. Select "Update and Security".
3. Click "Recovery".
4. Under "Advanced startup", click "Restart now".
The system will restart and show the Windows 10 boot menu.
5. Select "Troubleshoot".
6. Choose "Advanced options".
7. Select "UEFI Firmware Settings".
8. Click "Restart" to restart the system and enter UEFI (BIOS).