

User Guide

Lenovo
ThinkEdge



Lenovo

ThinkEdge SE50a-12 Gen1, ThinkEdge SE50a-15 Gen1, ThinkEdge
SE50a-21 Gen1

About this documentation

This guide applies to Lenovo product model(s) listed below:

Product name	Product model	Operating temperature
ThinkEdge SE50a-12 Gen1	13MR, 13MS, 13MX, 13MY, 13N0, and 13N1	0°C–50°C (32°F–122°F)
ThinkEdge SE50a-15 Gen1	13N2, 13N3, 13N8, 13N9, 13NA, and 13NB	0°C–50°C (32°F–122°F)
ThinkEdge SE50a-21 Gen1	13NC, 13ND, 13NJ, 13NK, 13NL, and 13NM	0°C–50°C (32°F–122°F)

Before using this documentation and the product it supports, ensure that you read and understand the following:

- [Safety and Warranty Guide](#)
- [Generic Safety and Compliance Notices](#)
- [Setup Guide](#)
- The latest compliance information is available at:

<https://www.lenovo.com/compliance>

Note:

- Illustrations in this documentation might look different from your product.
- Depending on the model, some optional accessories, features, and software programs might not be available on your computer.
- Depending on the version of operating systems and programs, some user interface instructions might not be applicable to your computer.
- Documentation content is subject to change without notice. Lenovo makes constant improvements on the documentation of your computer, including this *User Guide*. To get the latest documentation, go to:

<https://smartsupport.lenovo.com>

- Microsoft® makes periodic feature changes to the Windows® operating system through Windows Update. As a result, some information in this documentation might become outdated. Refer to Microsoft resources for the latest information.

Restricted access location statement



Caution — Hot Surface During operation, the heat sink and adjacent enclosure surfaces can reach high temperatures and may cause burns to the skin if touched. Switch off the unit and allow it to cool down before handling.



Attention:

This product is used in restricted access location. During operation, the temperature of the computer surface might become very high and burn the skin. Avoid keeping your hands or any other part of your body in contact with the computer.

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Contents

About this documentation.....	i
Chapter 1 Product overview.....	1
Front view.....	1
Rear view.....	5
Left view.....	6
Right view.....	8
Bottom view.....	8
Features and specifications.....	9
USB specifications.....	11
Chapter 2 Customize your computer.....	12
Configurable connectors.....	12
Serial connectors.....	12
Digital Input and Digital Output connector.....	13
CAN bus connector.....	15
Ethernet connectors.....	15
Use the software development kit (SDK).....	16
Get started with Windows 11 IoT Enterprise 2024 LTSC.....	16
Chapter 3 Use your computer.....	17
Mount on wall.....	17
Mount on stand.....	19
Mount into panel.....	21
Connect an AC/DC power adapter to the DC power connector.....	23
Connect an external display.....	24
Use the touch screen (for selected models).....	24
Antenna location and cable connection.....	26
Access networks.....	26
Set power button behaviors.....	27
Connect to a Bluetooth-enabled device (for selected models).....	27
Chapter 4 Secure your computer and information.....	28
Use software security solutions.....	28
UEFI BIOS passwords.....	28
Chapter 5 UEFI BIOS.....	30
Enter the UEFI BIOS menu.....	30
Navigate the UEFI BIOS menu.....	30
Update the UEFI BIOS.....	31
From the Lenovo Support Web site.....	31
From the Windows Update.....	31
Change the Serial Port UARTtype.....	32
Chapter 6 Troubleshooting and recovery.....	33
Basic procedure for resolving computer problems.....	33
Troubleshooting.....	33
Startup problems.....	33
Audio problems.....	34
Network problems.....	35
Performance problems.....	37
Storage drive problems.....	38

Serial connector problems.....	38
USB device problems.....	38
Software problems.....	39
Recovery.....	39
Restore system image to factory image.....	39
Restore system files and settings to an earlier point.....	39
Restore your files from a backup.....	40
Reset your computer.....	40
Use advanced options.....	40
Windows automatic recovery.....	40
Update the device driver.....	40
Chapter 7 Hardware replacement.....	42
What is CRU.....	42
CRU list.....	42
System board.....	43
System board diagram.....	46
Clear CMOS jumper.....	47
Set the serial connector port jumper (JCOM_SEL1).....	47
Power adapter and power cord.....	48
External Wireless LAN antennas.....	48
Bottom cover.....	50
M.2 solid-state drives.....	51
Memory.....	55
Chapter 8 Help and support.....	59
Self-help resources.....	59
Call Lenovo.....	59
Before you contact Lenovo.....	59
Lenovo Customer Support Center.....	61
Purchase accessories.....	62
Purchase additional services.....	62
Appendix A Important notice for Quebec consumers.....	63
Appendix B Notice for USB connector name update.....	64
Appendix C Notices and trademarks.....	65

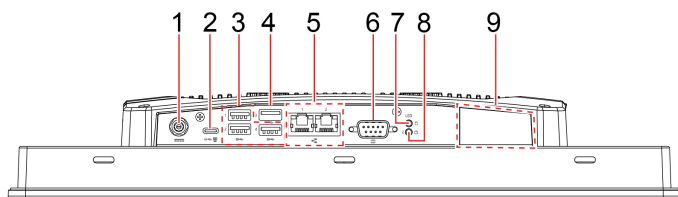
Chapter 1 Product overview



Attention:

During operation, the computer surface might become very hot and burn the skin. Avoid keeping your hands or any other part of your body in contact with the computer.

Front view



Item	Description	Item	Description
1	DC power connector	2	USB-C connector (USB 10Gbps)
3	USB-A connectors (USB 5Gbps)	4	USB-A connector (Hi-Speed USB)
5	Ethernet connectors	6	Serial connector
7	Storage drive activity indicator	8	Power status indicator
9	Flexible I/O connector		

Statement on USB transfer rate

Depending on many factors such as the processing capability of the host and peripheral devices, file attributes, and other factors related to system configuration and operating environments, the actual transfer rate using the various USB connectors on this device will vary and will be slower than the data rate listed in "USB specifications".

DC power connector

Connect the power cord to your computer for power supply.

Ethernet connector (2.5G)

In industrial environments, it is recommended to use shielded network cables. Connect to a local area network (LAN).

When the yellow indicator is on, the computer is connected to a LAN. When the green/orange indicator blinks, data is being transmitted.

The LAN port 1 supports Intel vPro® technology.

Power status indicator (DC in 12 V)

The power status indicator shows the system status of your computer.

LED status	Indication
 Solid green	The computer is operating normally.
Off	The computer is off or in sleep mode.

Storage drive activity indicator

LED status	Indication
 Blinking yellow	The indicator is showing data transfer status.
Off	The computer is not transferring data or the computer is off.

Serial connector

Used to connect an external modem, a serial printer, or other devices that use a serial connector.

For the serial connector on board, you can change the serial mode among RS232 (default), RS422, and RS485. For more information, see [“Change the Serial Port UART type”](#) on page 32”.

Flexible I/O connector

The connector in the IET expansion slot can be configured to be a serial connector, CANbus connector, or USB-A connector. Use the connector to connect an external modem, a CANbus device, or an audio or video device.

IET expansion slot

The connector located in this slot varies depending on the optional IET module installed on the device:

- **With the RS-232 × 2 module:**

Blanking plate. This slot is covered with a blanking plate and has no functional connector on the front panel, as shown in the following figure.

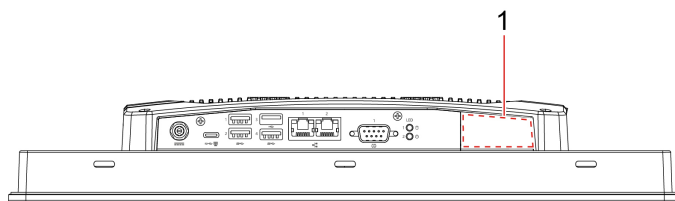


Figure 1: Front view with the RS-232 × 2 module

Item	Description
1	Blanking plate

For details on the relevant serial ports of the module on the side view, see "Left view with the RS-232 × 2 module" in [Side view](#) on page 6.

- **With the DIO + CAN bus module:**

CAN bus connector. This slot is installed with a 2-pin connector on the front panel for CAN bus communication, as shown in the following figure.

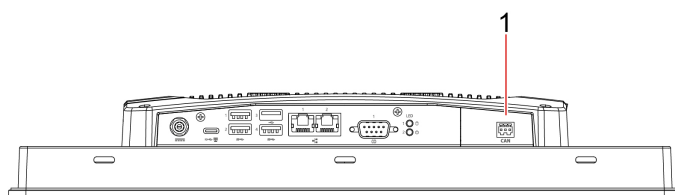


Figure 2: Front view with the DIO + CAN bus module

Item	Description
1	CAN bus connector

For details on the relevant DIO port of the module on the side view, see "Left view with the DIO + CAN bus module" in [Side view](#) on page 6.

- **With the USB 5Gbps × 4 module:**

USB 5Gbps connector. This slot is installed with a USB Type-A port supporting data transfer rates up to 5Gbps on the front panel, as shown in the following figure.

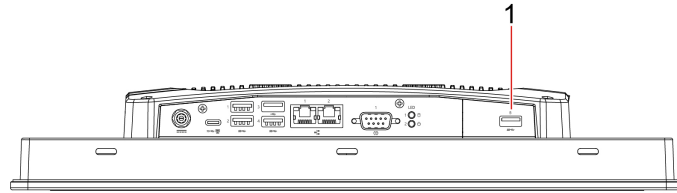
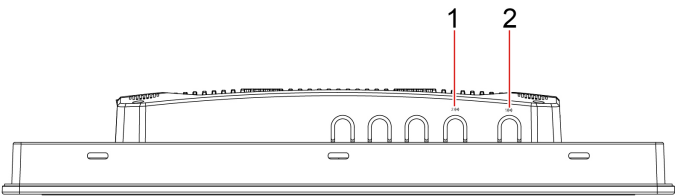


Figure 3: Front view with the USB 5Gbps × 4 module

Item	Description
1	USB-A connector (USB 5Gbps)

For details on the remaining USB ports of the module on the side view, see "Left view with the USB 5Gbps × 4 module" in [Side view](#) on page 6.

Rear view



Item	Description	Item	Description
1	Wi-Fi® antenna slot*	2	Wi-Fi antenna slot*

* for selected models

Wi-Fi antenna slot

Used to install the rear Wi-Fi antenna cable connector that is available only on some models. The rear Wi-Fi antenna is installed on the rear Wi-Fi antenna cable connector.

Left view

On the left side, the entire IET expansion module is optional and can be replaced with one of the following IET modules:

- RS-232 × 2 module
- DIO + CAN bus module
- USB 5Gbps × 4 module

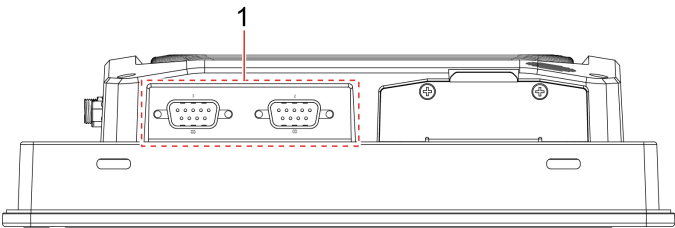


Figure 4: Left view with the RS-232 × 2 module

Item	Description
1	RS-232 connectors

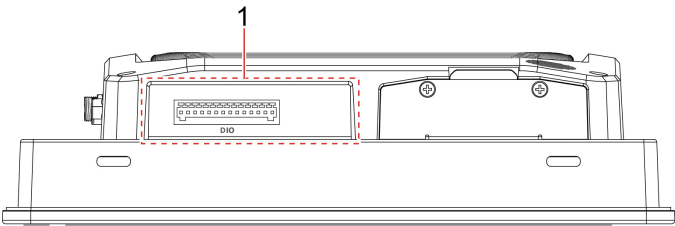


Figure 5: Left view with the DIO + CAN bus module

Item	Description
1	DIO connector

DIO connector

Used to connect an external modem, a serial printer, or other devices that use a serial connector.

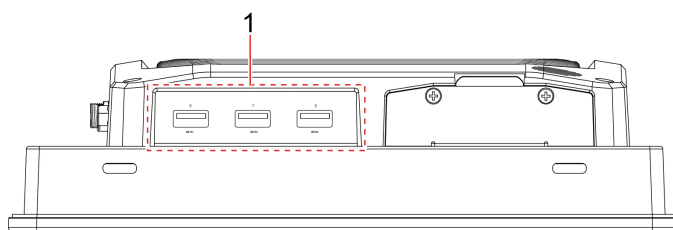
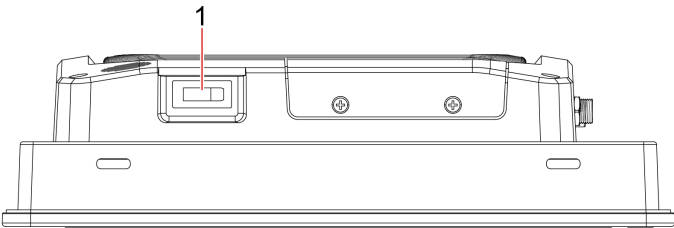


Figure 6: Left view with the USB 5Gbps × 4 module

Item	Description
1	USB-A connectors (USB 5Gbps)

Right view

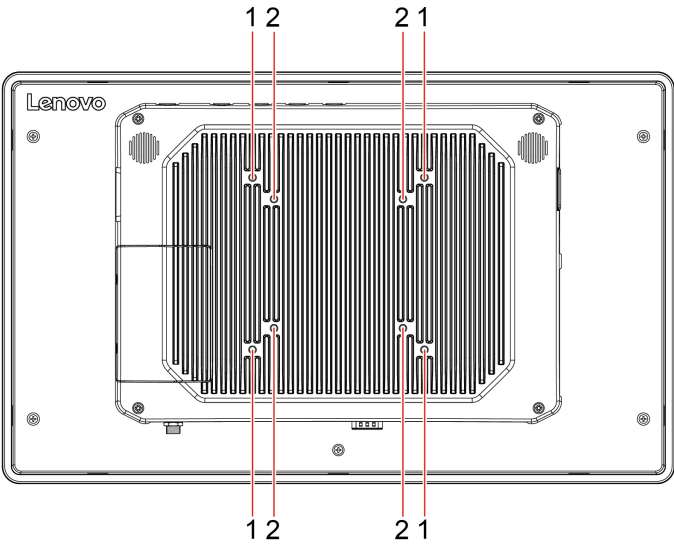


Item	Description
1	Power button

Power button

Use the power button to switch on or off the system. Keep holding the power button on can force shutdown the PC.

Bottom view



Item	Description	Item	Description
1	VESA® threaded holes (hole pattern: 100 × 100 mm)	2	VESA threaded holes (hole pattern: 75 × 75 mm)

VESA threaded holes

Connect the matched VESA mount bracket kit with the screws (M4 × 4 mm × 4 pcs) provided by Lenovo when you install the computer on a wall or other non-flammable mounting surface.

Features and specifications

Specification	Description
Dimensions	- ThinkEdge SE50a-12 Gen1: 293.77 × 226.31 × 54.5 mm (11.57 × 8.91 × 2.15 inches) - ThinkEdge SE50a-15 Gen1: 391.21 × 239.21 × 61.0 mm (15.40 × 9.42 × 2.40 inches) - ThinkEdge SE50a-21 Gen1: 538.05 × 341.05 × 64.0 mm (21.18 × 13.43 × 2.52 inches)
Weight (without packaging)	Maximum configuration as shipped: - ThinkEdge SE50a-12 Gen1: 3.2 kg (7.05 lb) - ThinkEdge SE50a-15 Gen1: 4.3 kg (9.48 lb) - ThinkEdge SE50a-21 Gen1: 7.4 kg (16.31 lb)
Hardware configuration	- Right-click the Start button to open the Start context menu. - Click Device Manager. Type the administrator password or provide confirmation if prompted.
Power supply	150-watt industrial power supply  Note: - From 0°C (32°F) to 40°C (104°F): 150-watt - From 0°C (32°F) to 50°C (122°F): 120-watt
Electrical input	- Input voltage: 12 V DC - Input frequency: 50/60 Hz
Microprocessor	To view the microprocessor information of your computer, right-click the Start button and then click System .
Memory	Double data rate 5 (DDR) memory module, 1 × SO-DIMM
Storage device	Your computer supports up to two M.2 solid-state drives: To view the storage drive capacity of your computer, right-click the Start button to open the Start context menu and then click Disk Management .

Specification	Description
	Note: - The storage drive capacity indicated by the system is less than the nominal capacity. - The Percentage Used value reflects the cumulative wear level of the M.2 solid-state drive. If this value exceeds 100%, it indicates that the M.2 solid-state drive has reached its maximum rated endurance. To safeguard your data and mitigate potential loss, it is recommended that you back up all files on the M.2 solid-state drive promptly and then replace it with a new one.
Video features	The integrated graphics card supports a USB-C connector.
Audio features	The integrated audio card supports the following: Internal speaker
Expansion	- Flexible I/O board* - M.2 NVMe SSD slot - M.2 SATA SSD slot - M.2 WiFi slot - Memory slot
Network features	- Ethernet LAN - Wireless LAN*

* for selected models

Operating environment

The operating environment is not applicable for hardware accessories. The operating temperature of various accessories depends on the corresponding accessory temperature specification.

The operating environment should be compatible with the industrial device's protection level of IP65 for the panel and IP41 for the rear cover (except the I/O area).

Temperature

- Operating: (150 W adapter) ambient temperature from 0°C (32°F) to 40°C (104°F) (with the air flow speed at 0.7 m/s)
- Operating: (120 W adapter) ambient temperature from 0°C (32°F) to 50°C (122°F) (with the air flow speed at 0.7 m/s)

Note:

If your computer is stored or transported in temperatures less than 0°C (32°F), allow the computer to rise slowly to an optimal operating temperature before use. Using the computer in a lower operating temperature might result in irreparable damage to your computer.

Relative humidity

- Operating: 95% (non-condensing) at 40°C (104°F)

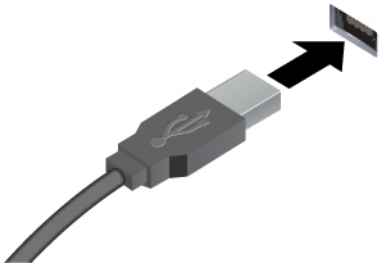
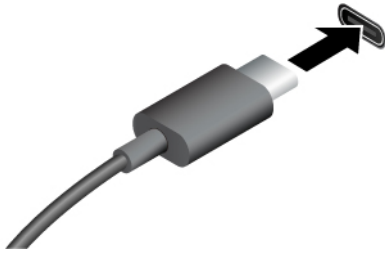
System memory speed

The actual system memory speed depends on the microprocessor model. For example, your computer comes with 5600 MT/s memory modules, but the microprocessor only supports up to 5200 MT/s memory modules. Then the system memory speed will be no faster than 5200 MT/s. For microprocessor models supported in your computer, contact the Lenovo Customer Support Center.

USB specifications

Note:

Depending on the model, some USB connectors might not be available on your computer.

Connector name	Description
 •  USB-A connector (Hi-Speed USB) •  USB-A connector (USB 5Gbps)	Connect USB-A compatible devices, such as a USB-A keyboard, USB-A mouse, USB-A storage device, or USB-A printer.
 •  USB-C connector (USB 10Gbps)	Connect to USB-C accessories to help expand your computer functionality. To purchase USB-C accessories, go to https://www.lenovo.com/accessories .

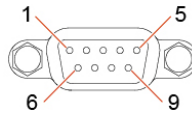
Chapter 2 Customize your computer

Connect your computer with an external display, a keyboard, and a mouse before deployment.

Configurable connectors

You can customize or configure the following connectors with compatible peripheral equipment based on your needs.

Serial connectors



Used to connect an external modem, a serial printer, or other devices that use a serial connector.

For the serial connector on board, you can change the serial mode among RS232 (default), RS422, and RS485. For more information, see [“Change the Serial Port UART type on page 32”](#).

Table 1: RS232 Pin definition mapping table

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

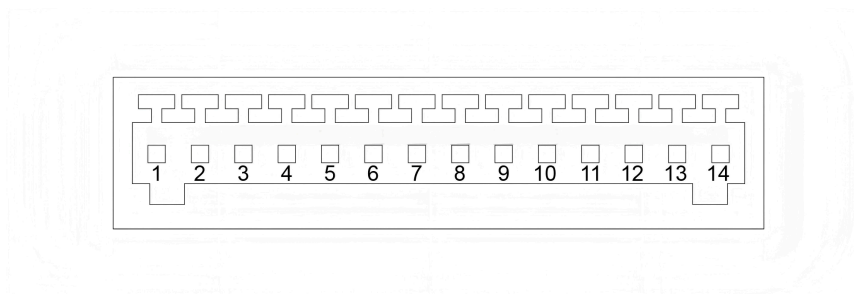
Table 2: RS422 Pin definition mapping table

Pin number	Pin definition
1	TxD-
2	TxD+
3	RxD+
4	RxD-
5	GND

Table 3: RS485 Pin definition mapping table

Pin number	Pin definition
1	DATA-
2	DATA+
5	GND

Digital Input and Digital Output connector

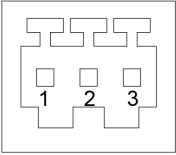


Used to connect external sensors, switches, relays, or other digital control devices. To customize this connector, see [Use the software development kit \(SDK\)](#) on page 16.

Table 4: Digital Input and Digital Output Pin definition mapping table

Pin number	Pin definition
1	Digital Input-0
2	Digital Input-1
3	Digital Input-2
4	Digital Input-3
5	Digital Input-4
6	Digital Input-5
7	Digital Output-0
8	Digital Output-1
9	Digital Output-2
10	Digital Output-3
11	Digital Output-4
12	Digital Output-5
13	+3.3 V
14	GND

CAN bus connector



Used to connect to a CAN bus enabled device or dongle.



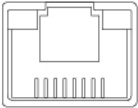
Note:

Connections made to this connector must use the cable (26 AWG-18 AWG / 105°C).

Table 5: CAN bus pin definition mapping table

Pin number	Pin definition
1	CANH
2	CANL
3	GND

Ethernet connectors



Ethernet connectors are equipped with Intel I225 Ethernet controllers that support 10/100/1000/2500 Mbps. The Ethernet port provides a standard RJ-45 jack connector with LED indicators on the left and right sides.



Note:

In industrial environments, it is recommended to use shielded network cables.

LED status	Indication
Light off on the left side	The indicator is showing that there is no Ethernet connection.
 Solid yellow on the left side	The indicator is showing successful Ethernet connection.

LED status	Indication
 Blinking yellow on the left side	The indicator is showing the data transfer status.
 Solid orange on the right side	The indicator is showing that the transfer speed is 2500 Mbps.
 Solid green on the right side	The indicator is showing that the transfer speed is 100/1000 Mbps.
 Blinking yellow on the left side and light off on the right side	The indicator is showing that the transfer speed is 10 Mbps.

Use the software development kit (SDK)

Lenovo provides a software development kit (SDK) for your computer. You can use the SDK to develop or configure the following functions or connectors based on your needs.

- **Digital Input and Digital Output connector (DIO connector):** You can collect signals and transfer data with sensors, transducers, and relay modules connected to the DIO connectors. For example, you can control output of lamps, 7-segment LED displays, relays, and other products which are used as an interface for digital communication with controllers such as a Programmable Logic Controller (PLC).
- **Serial connector:** You can use this connector as serial communication. For example, you can collect serial logs connected to a peripheral equipment to your computer.
- **CAN bus connector:** The CAN bus connector is a high-integrity serial bus system for networking intelligent devices. CAN buses and compatible peripheral equipment are common components in automotive and industrial systems.
- **Customizable LED indicator:** You can customize the LED to any function as you preferred. The default is for wireless WAN.
- **Watchdog timer:** You can create a watchdog timer to monitor whether your computer is running correctly and to restart your computer automatically when your computer hangs without human intervention.

To download the software development kit (SDK):

1. Go to https://support.lenovo.com/docs/thinkedge_sdk.
2. Follow the on-screen instructions to select the correct software development kit for your computer.

Get started with Windows 11 IoT Enterprise 2024 LTSC

You can access the following web site to learn more details on the Windows 11 IoT Enterprise 2024 LTSC OS:

https://learn.microsoft.com/windows/iot/iot-enterprise/getting_started.

Chapter 3 Use your computer

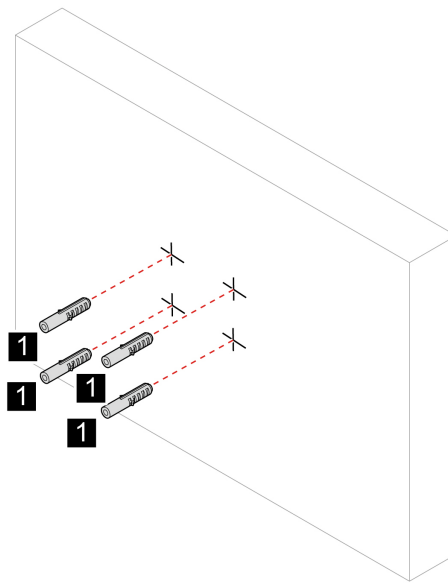
Your computer offers versatile installation options, supporting wall-mounted, stand-mounted, and panel-mounted configurations to suit various operational environments.

Mount on wall

You can mount your computer on the wall by using the following tools.

To mount the panel PC on the wall, do the following:

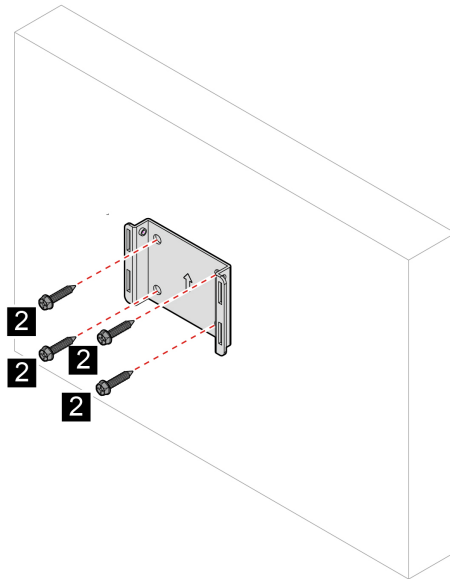
1. Mark the mounting hole positions on the wall, then drill and insert the wall anchors (×4) with the corresponding screws.



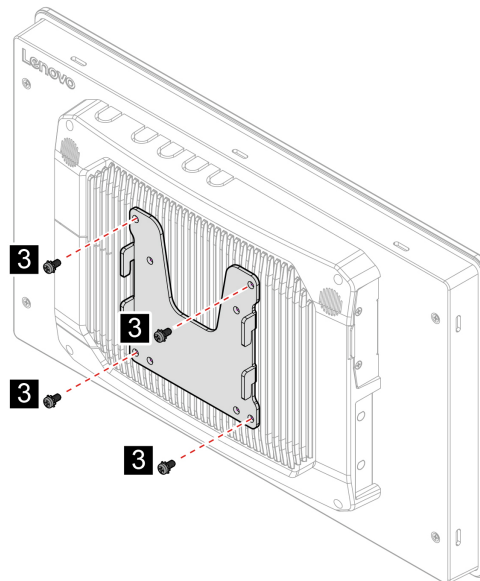
Attention:

Use the screws provided by Lenovo to avoid any unpredictable damage to your computer.

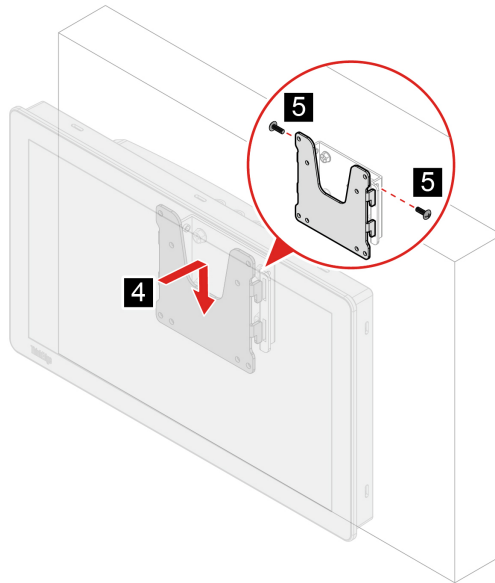
2. Secure the mount plate to the wall by inserting four M5 screws into pilot holes and tightening them.



3. Insert four M4 screws into the VESA holes on the panel PC and tighten them to secure the bracket to the rear panel. Ensure that the thread depth of the screws on the rear panel does not exceed 4 mm.



4. Align the wall mount bracket attached to the panel PC with the wall mount plate on the wall and slide the panel PC downwards to hang the bracket on the mount plate. Secure the panel PC in place by tightening screws in the wall mount bracket.



Attention:

Use the screws provided by Lenovo to avoid any unpredictable damage to your computer.

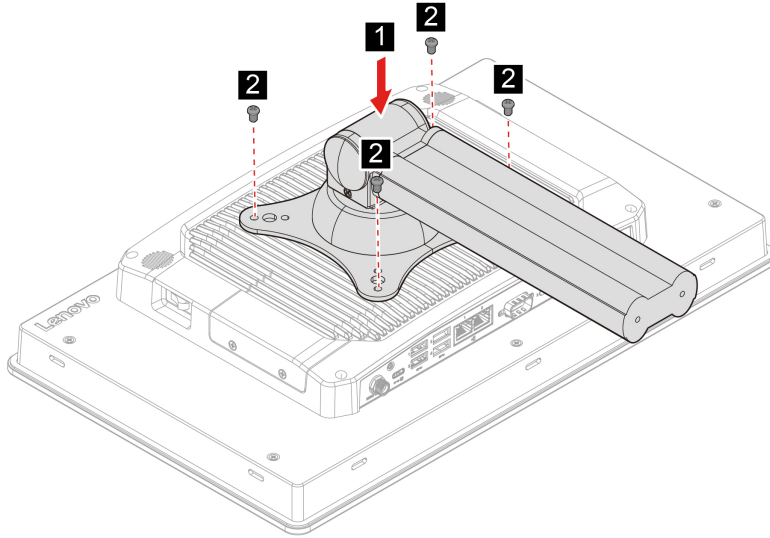
Screw (quantity)	Color	Torque (kgf-cm)
M5 × L15 mm, countersunk head (2)	Black	4.0
M4 × L8 mm, countersunk head (4)	Black	7.2–8.8
M5 × L31.5 mm, hex washer head (4)	Black	7.2–8.8

Mount on stand

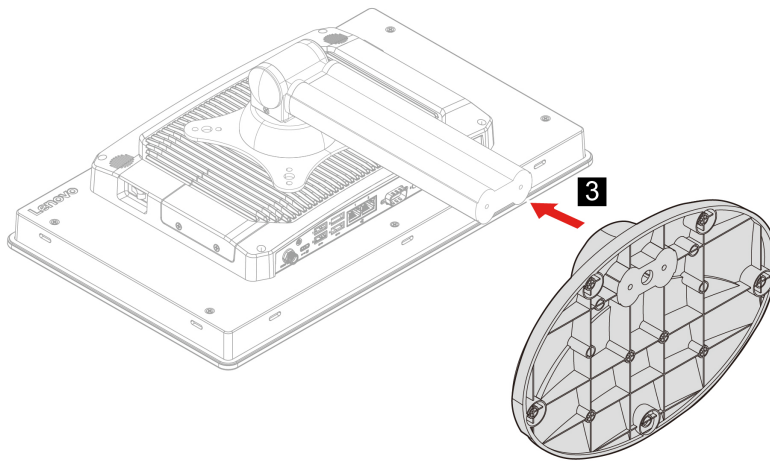
This Panel PC can be mounted on a VESA-compliant stand with a 100 mm interface pad.

To mount the panel PC on a stand, do the following:

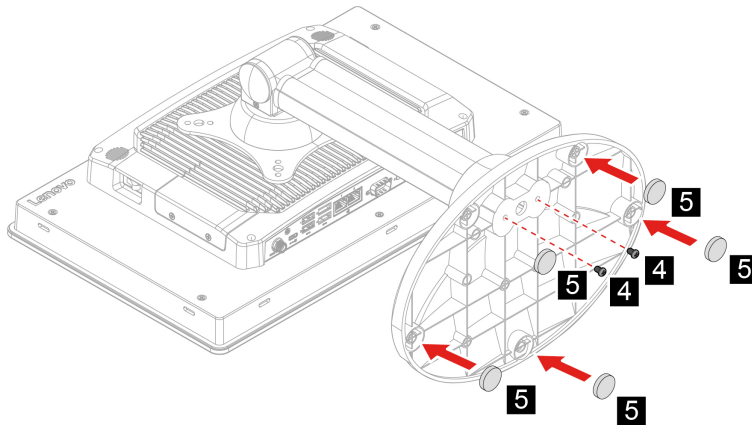
1. Prepare a flat table and place a soft cloth or foam pad on it to protect the screen. Place the computer screen face down on the soft surface.
2. Align the holes on the stand's upper mounting plate with the four VESA holes on the back of the computer. Use four M4 screws to fasten the stand arm to the computer. Tighten them securely with a screwdriver.



3. Insert the bottom of the stand's vertical column into the opening of the base plate.



- 4.** While holding the parts together, carefully tilt the computer or position it so you can access the bottom of the base.
- 5.** Use the remaining two M4 screws to secure the base plate to the column from underneath.



6. Peel off the backing of the five rubber feet and stick them onto the designated circular spots on the bottom of the base. This prevents the stand from slipping.
7. Stand the computer upright on the desk. Ensure that the computer does not wobble and the base is tightly connected before regular use.



Attention:

Use the screws provided by Lenovo to avoid any unpredictable damage to your computer.

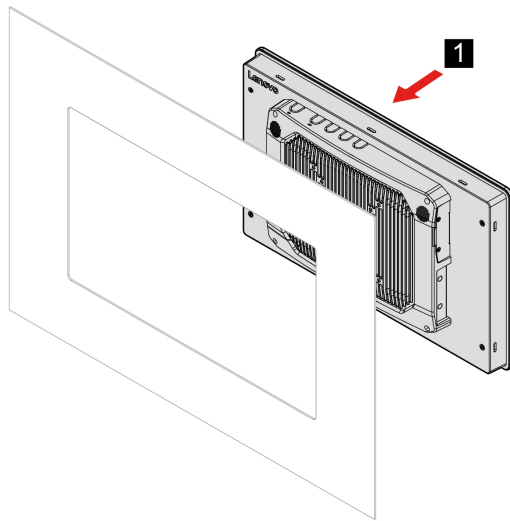
Screw (quantity)	Color	Torque (kgf-cm)
M4 × L6 mm, pan head (4)	Black	7.2–8.8
M3 × L4 mm, pan head (2)	Black	7.2–8.8

Mount into panel

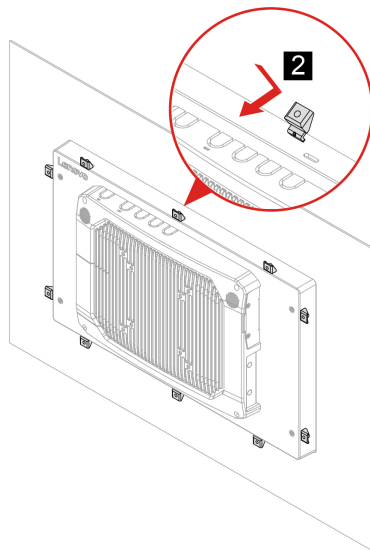
This panel PC can be mounted into a panel.

To mount the panel PC into a panel, do the following:

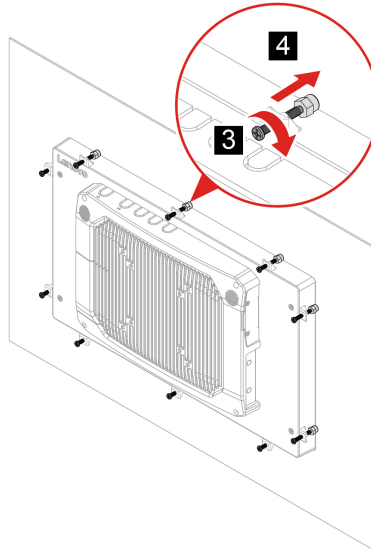
1. Install the panel PC in the cabinet and retrieve hook brackets from the accessory box.



2. Insert the hook brackets into the holes by following the direction of the arrows shown in the below figure and hang the panel PC.



3. Tighten the M4 screws to affix the panel PC in place, fasten all the hook bracket to ensure panel PC well fix at cabinet.



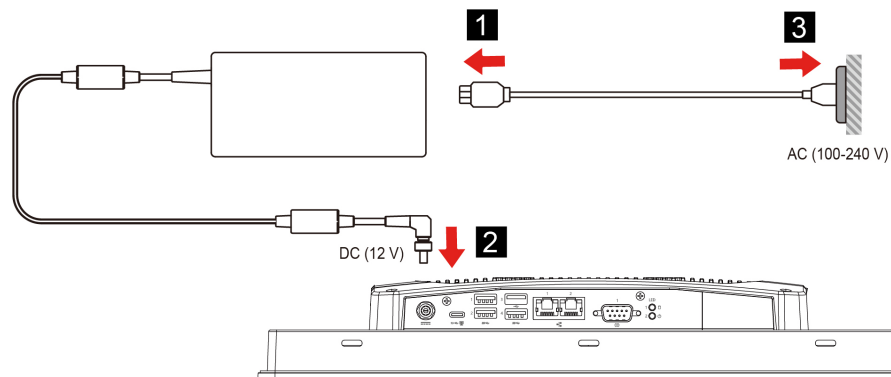
Attention:

Use the screws provided by Lenovo to avoid any unpredictable damage to your computer.

Screw (quantity)	Color	Torque (kgf-cm)
M4 × L25 mm, pan head (10)	Black	3.6–4.4

Connect an AC/DC power adapter to the DC power connector

For selected models, you can connect an AC/DC power adapter to the DC power connector through a DC converter cable. Use the DC converter cable provided by Lenovo in box.



Connect an external display

Connect a projector or a monitor to your computer to give presentations or expand your workspace.

Connect a wireless display

Ensure that both your computer and the wireless display support Miracast®.

Press Windows logo key + K and then select a wireless display to connect.

Change display settings

1. Right-click a blank area on the desktop and select display settings.
2. Select the display that you want to configure and change display settings of your preference.

Use the touch screen (for selected models)

For computers with a touch-enabled screen, you can touch the screen directly with your fingers and interact with computer in a simple way. The following sections introduce frequently used touch gestures.

Note:

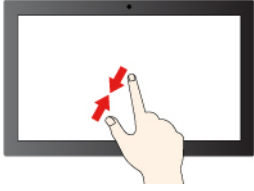
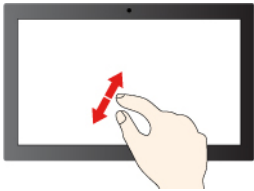
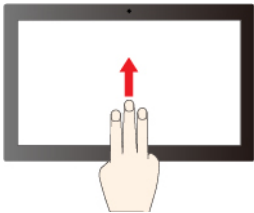
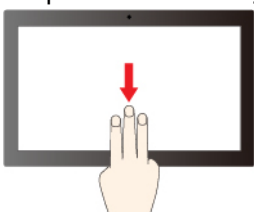
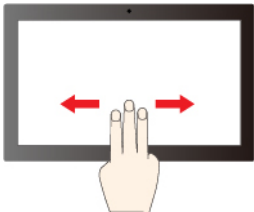
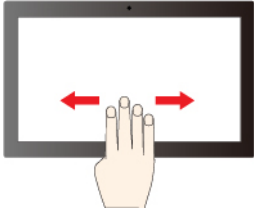
- Some gestures might not be available when you are using certain apps.
- Do not use gloved fingers or incompatible pens for input on the screen. Otherwise, the touch screen might be not sensitive or does not respond.
- The touch screen is delicate. Do not apply pressure on the screen or touch the screen with anything hard or sharp. Otherwise, the touch panel might malfunction or get damaged.

One finger touch gesture

To do this	Gesture
Open a shortcut menu.	Tap and hold. 
Open notification center.	Swipe from the right. 

Two-finger touch gesture

To do this	Gesture
Zoom out.	Move two fingers towards.

To do this	Gesture
	
Zoom in.	Spread two fingers apart. 
Three- and four-finger touch gesture	
To do this	Gesture
Show all open windows.	Swipe with three fingers up. 
Show the desktop.	Swipe with three fingers down. 
Switch apps.	Swipe with three fingers to the left or right. 
Switch desktops.	Swipe with four fingers to the left or right. 

To enable three- and four-finger touch gestures, do the following:

1. Type **touch gesture** in the Windows search box and then press Enter.
2. Turn on the **Three- and four-finger touch gestures** switch.

Note:

If the touch screen is not sensitive or does not respond, do the following:

1. Turn off the computer.
2. Use a dry, soft, and lint-free cloth or a piece of absorbent cotton to remove fingerprints or dust from the touch screen. Do not apply solvents to the cloth.
3. Restart the computer and check if the touch screen works normally.
4. If the touch screen cannot work normally, type **Windows Update** in the Windows search box and then press Enter.
5. Follow the on-screen instructions to update Windows.
6. After updating Windows, check if the touch screen works normally.
7. If the touch screen still cannot work normally, the touch screen might get damaged. You can call Lenovo Customer Support Center to get further help.

Antenna location and cable connection

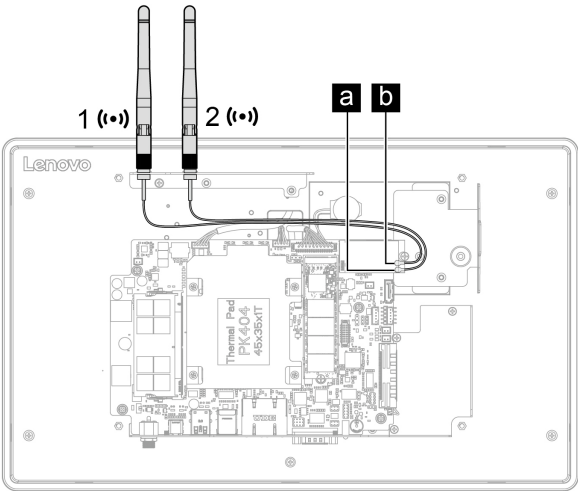


Figure 7: Antenna location and cable connection

External antennas	Location	Cable connection
1, 2 Wireless LAN antennas	Rear panel	a : Wireless LAN auxiliary antenna b : Wireless LAN main antenna

Access networks

Your computer helps you connect to the world through a wired or wireless network.

Connect to the wired Ethernet

Connect your computer to a local network through the Ethernet connector on your computer with an Ethernet cable.

Connect to Wi-Fi networks (for selected models)

If your computer includes a wireless LAN module, you can connect your computer to Wi-Fi networks. The wireless LAN module on your computer may support different standards. For some countries or regions, use of 802.11ax may be disabled according to local regulations.

1. Install Wireless LAN antennas if any. See [Antenna location and cable connection](#) on page 26. Pay attention to the silk print number of each wireless LAN antenna and ensure that it matches the silk print number of the corresponding wireless LAN antenna slot.
2. Turn on your computer.
3. Click the network icon in the Windows notification area. A list of available wireless networks is displayed.
4. Select a network available for connection. Provide required information, if needed.

Connect to a cellular network (for selected models)

If your computer supports wireless WAN connections, you can purchase a nano-SIM card to establish wireless WAN connections and get online using the cellular signal.



Note:

- The cellular service is provided by authorized mobile service carriers in some countries and regions. You must have a cellular plan from a service carrier to connect to the cellular network.
- When the system resumes from shut down, hibernation mode, or sleep mode, users need to reenter the Pin code.

Set power button behaviors

You can define what the power button does according to your preference. For example, by pressing the power button, you can turn off the computer or put the computer to hibernation mode.

To change what the power button does:

1. Go to **Control Panel** and view by large icons or small icons.
2. Click **Power Options** > **Choose what the power buttons do**.
3. Change the settings as you prefer.

Connect to a Bluetooth-enabled device (for selected models)

You can connect all types of Bluetooth-enabled devices to your computer, such as a keyboard, a mouse, a smartphone, or speakers. Place the device that you are attempting to connect to less than 10 meters (33 feet) from the computer.

1. Type Bluetooth in the Windows search box and then press Enter.
2. Turn on Bluetooth, if it is off.
3. Select a Bluetooth device, and then follow the on-screen instructions.

Your Bluetooth device and computer will automatically connect the next time if the two devices are in range of each other with Bluetooth turned on. You can use Bluetooth for data transfer or remote control and communication.

Chapter 4 Secure your computer and information

Use software security solutions

The following software solutions help secure your computer and information.

- **Windows Security**

Windows Security is a software built-in to the operating system. It continually scans for malicious software, viruses, and other security threats. Besides, Windows updates are downloaded automatically to help keep your computer safe. Windows Security also enables you to manage tools including firewall, account protection, application and browser control, and so on.

Note:

For more information about how to use these software solutions, refer to their help systems respectively.

UEFI BIOS passwords

You can set passwords in UEFI (Unified Extensible Firmware Interface) BIOS (Basic Input/Output System) to strengthen the security of your computer.

Password types

You can set a power-on password, supervisor password, system management password, or hard disk password in UEFI BIOS to prevent unauthorized access to your computer. However, you are not prompted to enter any UEFI BIOS password when your computer resumes from sleep mode.

- **User password**

When a user password is set, you are prompted to enter a valid password each time the computer is turned on.

- **Administrator password**

Setting an administrator password deters unauthorized users from changing configuration settings. If you are responsible for maintaining the configuration settings of several computers, you might want to set an administrator password.

When an administrator password is set, you are prompted to enter a valid password each time you try to enter the BIOS menu.

If both the user password and the administrator password are set, you can enter either password. However, you must use your administrator password to change any configuration settings.

- **HDD security configuration (for selected models)**

Setting the HDD security configuration prevents unauthorized access to the data on the storage drive. When the HDD security configuration is set, you are prompted to enter a valid password each time you try to access the storage drive.

Note:

After you set the HDD security configuration, your data on the storage drive is protected even if the storage drive is removed from one computer and installed in another.

Set, change, and remove a password

Before you start, print these instructions.

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Security**.
3. Depending on the password type, select **Administrator password**, **User password**, or **HDD password** and press Enter.
4. Follow the on-screen instructions to set, change, or remove a password.
5. Press F10 or Fn+F10 to save the changes and exit.

You should record your passwords and store them in a safe place. If you forget the passwords, contact a Lenovo-authorized service provider.



Note:

If the hard disk password is forgotten, Lenovo cannot remove the password or recover data from the storage drive.

Chapter 5 UEFI BIOS

Enter the UEFI BIOS menu

Turn on or restart the computer. When the logo screen is displayed, press F1 or Fn+F1 to enter the UEFI BIOS menu.

Note:

If you have set UEFI BIOS passwords, enter the correct passwords when prompted. You also can select **No** or press Esc to skip the password prompt and enter the UEFI BIOS menu. However, you cannot change the system configurations that are protected by passwords.

Navigate the UEFI BIOS menu

Follow the on-screen instructions to navigate in the UEFI BIOS menu.

The table below introduces the available settings of the UEFI BIOS menu. You can follow the on-screen instruction to navigate in the UEFI BIOS menu.

Note:

The UEFI BIOS menu might vary depending on system configurations.

Menu	Introduction
Main	This category provides the general product-related and firmware information including system summary, machine type, product serial number, UUID number, etc.
Advanced	This category provides advanced information about the computer such as the CPU features. Advanced → Board & Panel Configuration introduces power management solutions.
Chipset	This category introduces how to configure various devices such as PCIe and HD audio.
Security	This category introduces various passwords, locks, and software to protect your computer.
Boot	This category introduces how to set the boot priority order.
Save & Exit	This category introduces how to exit as you prefer.

Menu	Introduction
MEBx	This category introduces how to configure Intel AMT for remote management and wake-up functionality.

To explore the detailed settings:

- For computers purchased in mainland China
You can contact Lenovo Customer Support Center as shown at <https://newsupport.lenovo.com.cn/contacts.html>.
- For computers purchased outside mainland China
You can go to Lenovo BIOS Simulator Center <https://download.lenovo.com/bSCO/index.html> to explore the detailed settings by your product name.

Note:

The Lenovo BIOS Simulator Center makes periodic updates of the settings. The UEFI BIOS simulator interface and description of settings might be different from that on your actual user interface.

Update the UEFI BIOS

When you install a new program, device driver, or hardware component, you might need to update the UEFI BIOS.

Download and install the latest UEFI BIOS update package by one of the following methods:

From the Lenovo Support Web site

Follow the instructions to update the UEFI BIOS from the Lenovo Support Web site.

For computers purchased in mainland China

1. Go to <https://newsupport.lenovo.com.cn>.
2. Click **Download drivers and software**, and select or search product.
3. Follow the on-screen instructions to download and install the latest UEFI BIOS update package.

For computers purchased outside mainland China

1. Go to <https://pcsupport.lenovo.com> and select the entry for your computer.
2. Click **Drivers & Software > Manual Update > BIOS/UEFI**.
3. Follow the on-screen instructions to download and install the latest UEFI BIOS update package.

From the Windows Update

Follow the instructions to update the UEFI BIOS from the Windows Update.

1. Type **Settings** in the Windows search box and press Enter.
2. Click **Windows Update > Check for Updates**.
3. If a BIOS update package appears in your update list, click **Download or Install** to initiate the update.

Change the Serial Port UARTtype

1. [Set the serial connector port jumper \(JCOM_SEL1\)](#) on page 47 to the required position.
2. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
3. Select **Advanced** > **Super IO Configuration** and press Enter. You can do the following:
 - Select **Serial Port1 Configuration** > **UART 232 422 485** and press Enter. You can select **UART 232**, **UART 422** or **UART 485** for Serial Port1 as you preferred.
4. Press F10 or Fn+F10 to save the changes and exit.

Chapter 6 Troubleshooting and recovery

This chapter provides solutions to resolve computer problems. Use the basic procedure as a starting point for resolving computer problems.

Basic procedure for resolving computer problems

Prerequisite

Before you start, read [Generic Safety and Compliance Notices](#), and print the following instructions.

1. Check that:
 - a. The cables for all connected devices are connected correctly and securely.
 - b. All components have been reassembled correctly.
 - c. All connected devices that require ac power are connected to properly grounded and working electrical outlets.
 - d. All connected devices are enabled in UEFI BIOS.
2. Use an antivirus program (if any) to see if the computer has been infected by a virus. If the program detects a virus, remove the virus.
3. See [Troubleshooting](#) on page 33 to resolve the problem you are experiencing and recover your operating system.
4. If the problem persists, contact Lenovo. See [Help and support](#) on page 59.

Troubleshooting

Use the troubleshooting information to find solutions to problems that have definite symptoms.

Startup problems

Problem	Solution
The computer does not start up when you press the power button.	• Ensure that the power cord is correctly connected to the rear of the computer and to a working electrical outlet. • If the computer has a secondary power switch on the rear of the computer, ensure that it is switched on. • The power indicator on the front of the computer is on. • The computer voltage matches the voltage available at the electrical outlet for your country or region.
The operating system does not start up from the correct storage drive or fails to start up	• Ensure that all storage drive signal cables and power cables are connected correctly. • Ensure that the storage drive the computer starts up from is listed as the first startup device in UEFI BIOS.

Problem	Solution
	• In rare cases, the storage drive with the operating system might get corrupted or damaged. In such cases, you might need to replace the storage drive. • If the computer is installed with an Optane memory: - Ensure that the Optane memory is not removed. - Ensure that the Optane memory is not damaged. Check the Optane memory using diagnostic tools.
The computer beeps multiple times before the operating system starts up.	Ensure that no keys are stuck.

Audio problems

Problem	Solution
The audio cannot be heard on the Windows operating system.	• If you are using powered external speakers that have an On/Off control, ensure that: - The On/Off control is set to the On position. - The speaker power cable is connected to a properly grounded, functional ac electrical outlet. • If your external speakers have a volume control, ensure that the volume is not set too low. • Click the volume icon in the Windows notification area on the taskbar. Check the speaker and volume settings. Do not mute the speaker or set the volume at a very low level. • If your computer has a front audio panel, ensure that the volume is not set too low. • Ensure that your external speakers (and headphones, if used) are connected to the correct audio connector on the computer. Most speaker cables are color-coded to match the audio connector. Note: When external-speaker or headphone cables are connected to the audio connector, the internal speaker, if present, is disabled. In most cases, if an audio adapter is installed in one of the expansion slots, the audio function built into the system board is disabled. Therefore, you must use the audio connectors on the audio adapter. • Ensure that the program you are running is designed for use in the Microsoft Windows operating system. If the program is designed to run in DOS, the program does not use the Windows sound feature.

Problem	Solution
	The program must be configured to use SoundBlaster Pro or SoundBlaster emulation. • Ensure that the audio device drivers are correctly installed.
The sound comes from one of the external speakers.	• Ensure that the speaker cable is inserted completely into the connector on the computer. • Ensure that the cable that connects the left speaker to the right speaker is securely connected. • Ensure that the balance settings are set correctly. 1. Right-click the volume icon in the Windows notification area on the taskbar. Then, click Open Volume Mixer and select the desired speaker. 2. Click the speaker icon on top of the volume control, and then click the Levels tab.

Network problems



Note:

The Wi-Fi and Bluetooth features are optional.

Problem	Solution
The computer cannot connect to an Ethernet LAN.	• Connect the cable from the Ethernet connector to the RJ45 connector of the hub. • Enable the Ethernet LAN feature in UEFI BIOS. • Enable the Ethernet LAN adapter. 1. Go to Control Panel and view by large icons or small icons. 2. Click Network and Sharing Center > Change adapter settings. 3. Right-click the Ethernet LAN adapter icon and click Enable. • Update or reinstall the Ethernet LAN driver. • Install all networking software that is necessary for your network environment. Check with your LAN administrator for the necessary networking software. • Set the same duplex for the switch port and the adapter. If you configured the adapter for full duplex, ensure that the switch port is also configured for full duplex. Setting a wrong duplex mode might degrade performance, cause data loss, or result in lost connections.

Problem	Solution
When a Gigabit Ethernet model computer is used at a speed of 1000 Mbps, the Ethernet LAN connection fails or errors occur.	Connect the network cable to the Ethernet connector using Category 5 wiring and a 100 BASE-T hub/switch (not 100 BASE-X).
The Wi-Fi feature does not work.	• Enable the Wi-Fi feature in UEFI BIOS. • Enable all Wi-Fi devices. 1. Right-click the Start button to open the Start context menu. 2. Click Device Manager. Type the administrator password or provide confirmation, if prompted. 3. Expand Network adapters to display all network devices. 4. Right-click each Wi-Fi device, and then click Enable device. • Enable the Wi-Fi feature in Windows Settings. 1. Open the Start menu. 2. Click Settings > Network & Internet > Wi-Fi. 3. Enable the Wi-Fi feature. • Update or reinstall the Wi-Fi driver.
The Bluetooth feature does not work.	• Enable the Bluetooth feature in UEFI BIOS. • Enable all Bluetooth devices. 1. Right-click the Start button to open the Start context menu. 2. Click Device Manager. Type the administrator password or provide confirmation if prompted. 3. Expand Bluetooth to display all Bluetooth devices. Right-click each Bluetooth device, and then click Enable device. 4. Expand Network adapters to display all network devices. Right-click each Bluetooth device, and then click Enable device. • Turn on the Bluetooth radio. 1. Open the Start menu. 2. Click Settings > Devices > Bluetooth & other devices. 3. Turn on the Bluetooth switch to enable the Bluetooth feature. • Update or reinstall the Bluetooth driver.
Sound does not come from the Bluetooth headset or headphones.	Select the Bluetooth headset or headphones as the default audio output device in advanced sound settings.

Performance problems

Problem	Solution
Excessive fragmented files exist on the storage drives.	 Note: Depending on the volume of the storage drives and amount of data stored on the storage drives, the disk-defragmentation process might take up to several hours. 1. Close any open programs and windows. 2. Open the Start menu. 3. Click Windows System > File Explorer > This PC. 4. Right-click your C drive and then click Properties. 5. Click the Tools tab. 6. Click Optimize. Select the drive as desired, and then click Optimize. 7. Follow the on-screen instructions.
The free storage drive space is insufficient.	• Clean out your Inbox, Sent Items, and Deleted Items folders from your e-mail application. • Clean up your C drive. 1. Open the Start menu. 2. Click Windows System > File Explorer > This PC. 3. Right-click your C drive and then click Properties. 4. Check the amount of free space, and then click Disk Cleanup. 5. A list of unnecessary file categories is displayed. Select the category you want to delete, and then click OK. • Disable some Windows features or remove some unnecessary programs. 1. Go to Control Panel and view by large icons or small icons. 2. Click Programs and Features. 3. Do one of the following: - To disable some Windows features, click Turn Windows features on or off. Follow the on-screen instructions. - To remove some unnecessary programs, select the program you want to remove, and then click Uninstall/Change or Uninstall.
The free memory space is insufficient.	• Right-click a blank area on the taskbar and open Task Manager. Then, end some tasks you are not performing. • Install additional memory modules.

Storage drive problems

Problem	Solution
Some or all storage drives are missing from the BIOS menu.	• Ensure that the signal cables and power cables for all the storage drives are connected correctly. • Ensure that the computer is configured correctly to support the storage drives. - If the computer is installed with SATA storage drives, ensure that the SATA storage drive enablement module (one to five storage drives) is installed. - If the computer is installed with SAS storage drives, ensure that the SAS storage drive enablement module (one to five storage drives) or the LSI MegaRAID SAS adapter is installed.

Serial connector problems

Problem	Solution
The serial connector cannot be accessed.	• Connect the serial cable from the serial connector on the computer to the serial device. If the serial device has its own power cord, connect the power cord to a grounded electrical outlet. • Turn on the serial device and keep the device online. • Install any programs supplied with the serial device. Refer to the documentation that comes with the serial device for more information. • If you added one serial-connector adapter, ensure that the adapter is installed correctly.

USB device problems

Problem	Solution
A USB device cannot be accessed.	• Connect the USB cable from the USB connector to the USB device. If the USB device has its own power cord, connect the power cord to a grounded electrical outlet. • Turn on the USB device and keep the device online. • Install any device drivers or programs supplied with the USB device. Refer to the documentation that comes with the USB device for more information. • Disconnect and reconnect the USB connector to reset the USB device.

Problem	Solution
	• Ensure that the Smart USB Protection function is disabled in UEFI BIOS.

Software problems

Problem	Solution
Some programs do not work as expected.	1. Check whether the problem is caused by a program. a. Ensure that the software is compatible with the computer. Refer to the information supplied with the software for more information. b. Verify that other software works correctly on the computer. c. Verify that the software you are using works on another computer. 2. If the problem is caused by a program: • Refer to the printed documentation that comes with the program or the help system of the program. • Update the program. • Uninstall the program and then reinstall it. To download a program that is preinstalled on your computer, go to https://smartsupport.lenovo.com and follow the on-screen instructions.

Recovery

This section introduces the recovery information of the Windows 11 operating system. Ensure that you read and follow the on-screen recovery instructions. The data on your computer might be deleted during the recovery process. To avoid data loss, make a backup copy of all the data that you want to keep.

Restore system image to factory image

Lenovo provides a Digital Download for your computer. For example, you can restore system image to factory image.

To download the Digital Download:

1. Go to <https://smartsupport.lenovo.com>.
2. Search by your computer product name to enter the support web page for your computer.
3. Click **Drivers & Software**.
4. Click **Order Now** at the **Get Recovery Media** tab and follow the on-screen instructions.

Restore system files and settings to an earlier point

1. Go to **Control Panel** and view by large icons or small icons.
2. Click **Recovery > Open System Restore**. Then, follow the on-screen instructions.

Restore your files from a backup

Note:

If you use the File History tool to restore your files from a backup, ensure that you backed up your data earlier with the tool.

1. Go to **Control Panel** and view by large icons or small icons.
2. Click **File History > Restore personal files**. Then, follow the on-screen instructions.

Reset your computer

In the resetting process, you can choose to keep your files or remove them when you reinstall the operating system.

Note:

The items in the graphical user interface (GUI) might change without notice.

1. Open the **Start** menu, and then click **Settings > Update & Security > Recovery**.
2. In the **Reset this PC** section, click **Get started**.
3. Follow the on-screen instructions to reset your computer.

Use advanced options

1. Open the **Start** menu, and then click **Settings > Update & security > Recovery**.
2. In the **Advanced startup** section, click **Restart now > Troubleshoot > Advanced options**.
3. Select a preferred option, and then follow the on-screen instructions.

Windows automatic recovery

Note:

Ensure that your computer is connected to AC power during the recovery process.

The Windows recovery environment on your computer operates independently from the Windows 11 operating system. It enables you to recover or repair the operating system even if the Windows 11 operating system fails to start.

After two consecutive failed boot attempts, the Windows recovery environment starts automatically. Then, you can choose repair and recovery options by following the on-screen instructions.

Update the device driver

Attention:

Reinstalling device drivers will change the current configuration of the computer.

You should download the latest driver for a component when you notice poor performance from that component or when you added a component. This action might eliminate the driver as the potential cause of a problem. Download and install the latest driver by one of the following methods:

- From the Lenovo Support Web site:
Go to <https://smartsupport.lenovo.com> and select the entry for your computer. Then, follow the on-screen instructions to download and install necessary drivers and software.
- From Windows Update:

 Note:

The device drivers provided by Windows Update might not be tested by Lenovo. It is recommended that you get device drivers from Lenovo.

1. Open the **Start** menu.
2. Click **Settings > Update & Security > Windows Update**.
3. Follow the on-screen instructions.

Chapter 7 Hardware replacement

What is CRU

Customer Replaceable Units (CRUs) are parts that can be replaced by the customer. Lenovo computers contain the following types of CRUs:

- **Self-service CRUs:** Refer to parts that can be replaced easily by customer themselves or by trained service technicians at an additional cost.
- **Optional-service CRUs:** Refer to parts that can be replaced by customers with a greater skill level. Trained service technicians can also provide service to replace the parts under the type of warranty designated for the customer's machine.

If you intend on installing the CRU, Lenovo will ship the CRU to you. CRU information and replacement instructions are shipped with your product and are available from Lenovo at any time upon request. You might be required to return the defective part that is replaced by the CRU. When return is required: (1) return instructions, a prepaid shipping label, and a container will be included with the replacement CRU; and (2) you might be charged for the replacement CRU if Lenovo does not receive the defective CRU within thirty (30) days of your receipt of the replacement CRU. For full details, see the Lenovo Limited Warranty documentation at:

https://www.lenovo.com/warranty/llw_02

CRU list

The following is the CRU list of your computer.

Self-service CRUs

- Power adapter*
- Power cord*
- Wireless LAN antenna*
- VESA mount kit
- Wall mount kit*
- Panel mount kit*
- Stand mount kit*

Optional-service CRUs

- Rear cover
- Side cover
- 2242 SSD bracket kit
- M.2 solid-state drive*
- Memory
- Aluminum bracket heatsink

* for selected models

System board

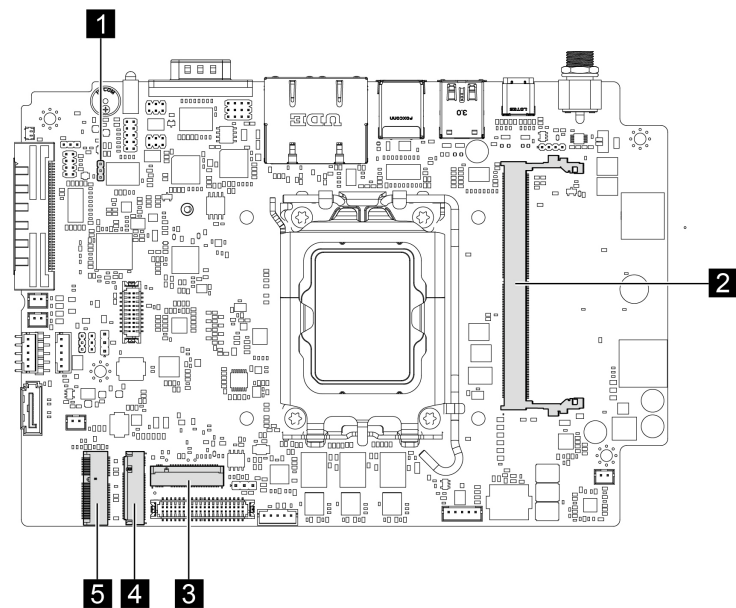


Figure 8: System board — front view

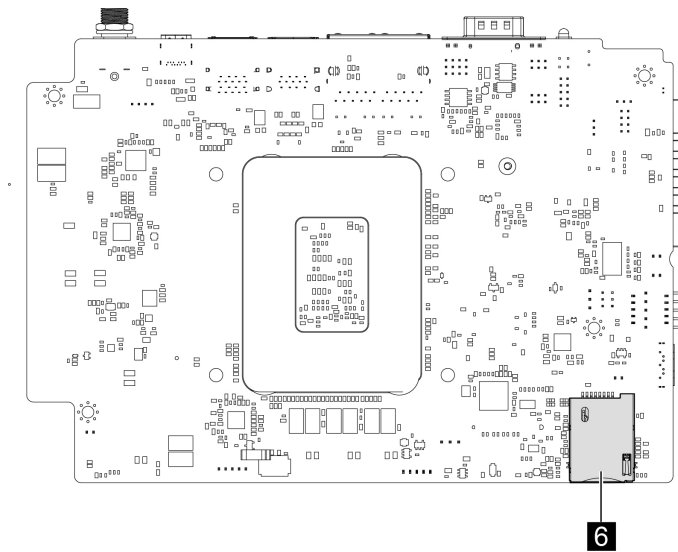
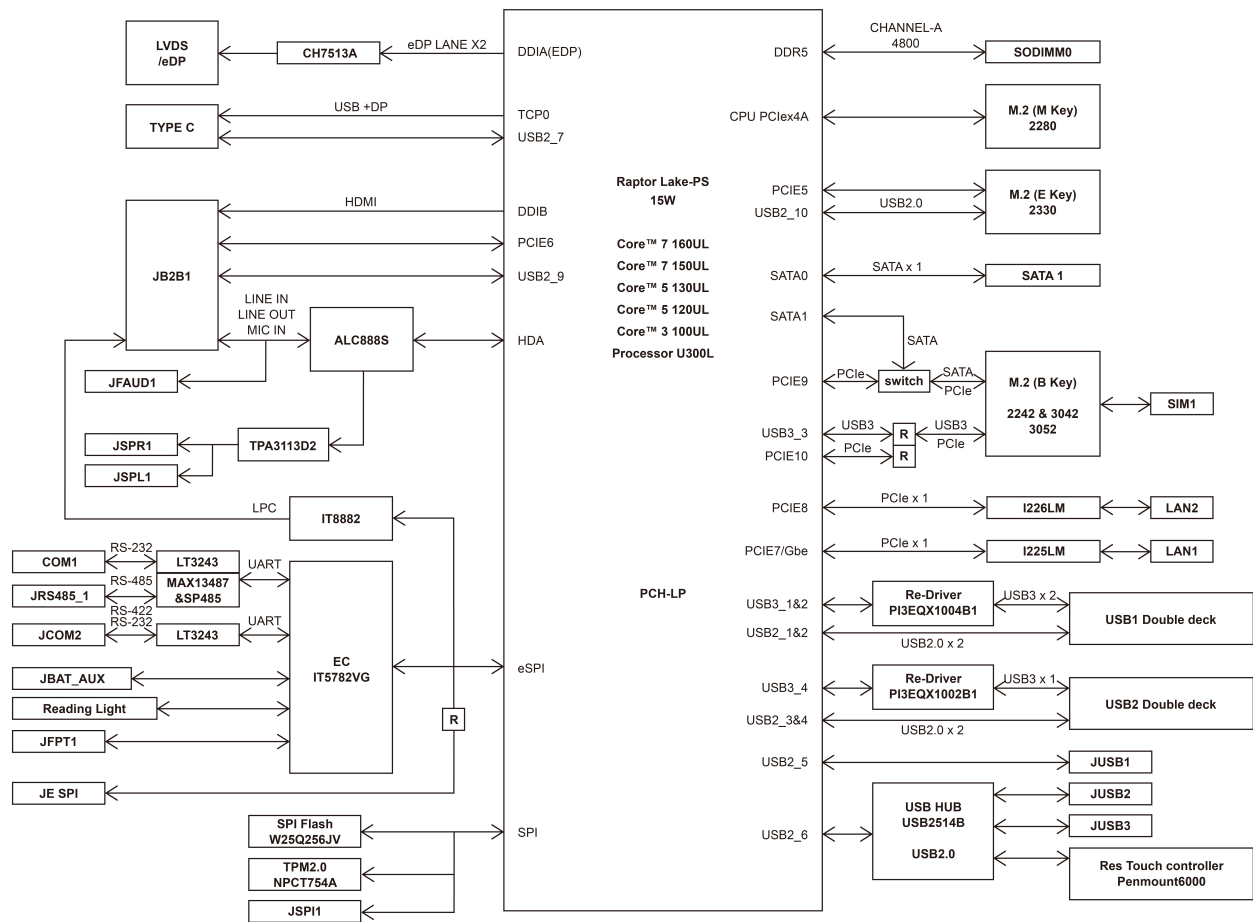


Figure 9: System board — rear view

Item	Description	Item	Description
1	CMOS jumper	2	Memory slot
3	M.2, Key M 2280 (PCIe x 4) SSD slot	4	M.2, Key B 2242 SATA SSD slot
5	M.2, Key E 2230 WiFi card slot	6	SIM card slot

System board diagram



Clear CMOS jumper

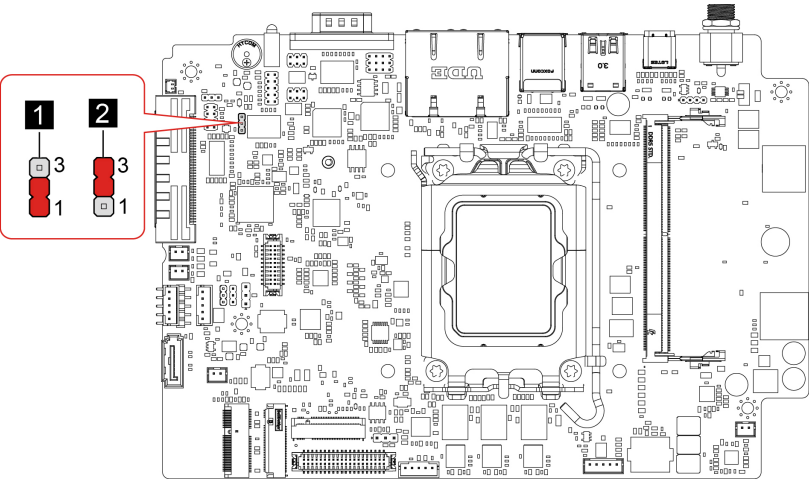
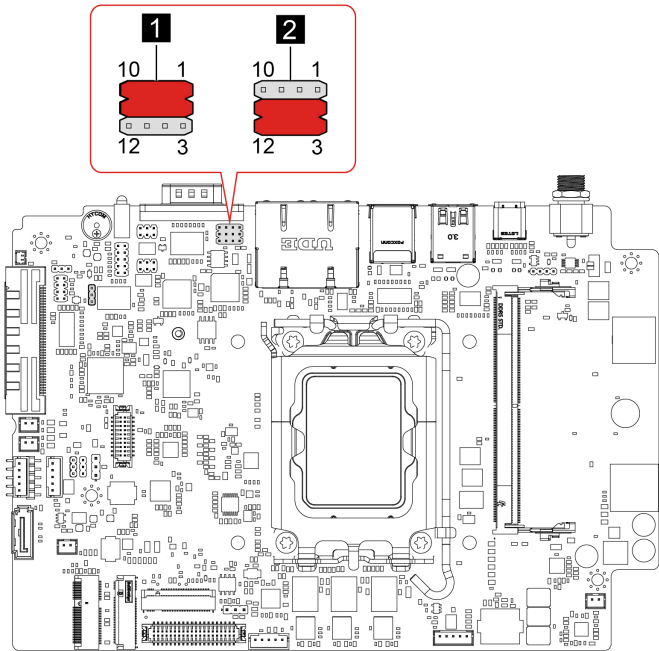


Figure 11: Clear CMOS jumper

Item	Description	Item	Description
1	Default position	2	Clear CMOS position

Set the serial connector port jumper (JCOM_SEL1)



Item	Description	Item	Description
1	RS232 (default)	2	RS422 or RS485

Power adapter and power cord

Prerequisite

Before you start, read [Generic Safety and Compliance Notices](#), and print the following instructions.



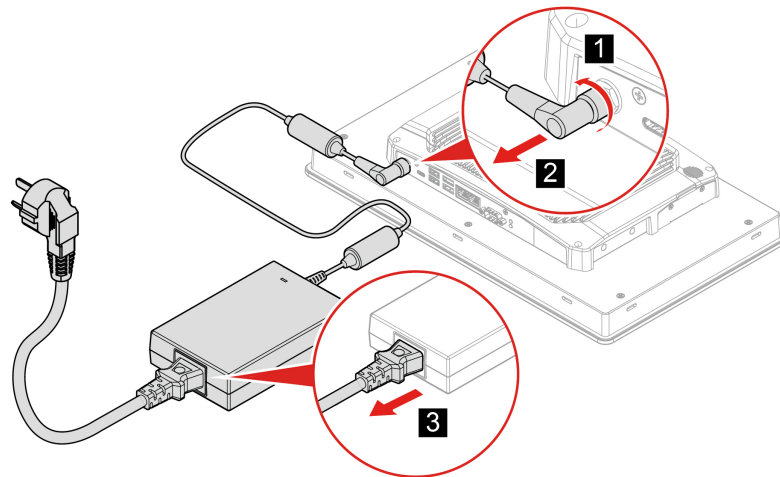
Avoid contact with the hot computer. During operation, the computer becomes hot enough to burn the skin. Before you touch the computer, turn off the computer, disconnect power, and wait approximately 30 minutes for the computer to cool.

For access, do the following:

1. Remove any media from the drives and turn off all connected devices and the computer.
2. Disconnect all power cords from electrical outlets and disconnect all cables from the computer.

Removal steps

1. Remove the power adapter.



2. Remove the power cord.

External Wireless LAN antennas

Prerequisite

Before you start, read [Generic Safety and Compliance Notices](#), and print the following instructions.



Avoid contact with the hot computer. During operation, the computer becomes hot enough to burn the skin. Before you touch the computer, turn off the computer, disconnect power, and wait approximately 30 minutes for the computer to cool.

Note:

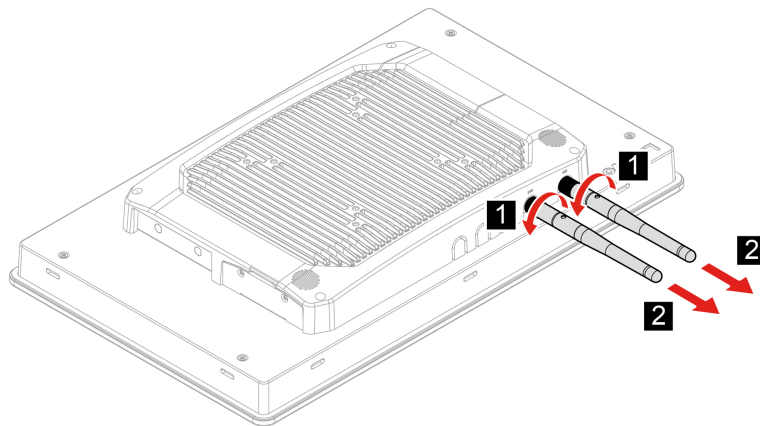
Install Wireless LAN antennas if any. See [Antenna location and cable connection](#) on page 26. Pay attention to the silk print number of each wireless LAN antenna and ensure that it matches the silk print number of the corresponding wireless LAN antenna slot.

For access, do the following:

1. Turn off all connected devices and the computer.
2. Disconnect all power cords from electrical outlets and disconnect all cables from the computer.
3. Unlock any locking device that secures the computer cover.
4. Remove the bracket, if any. See [Mount on wall](#) on page 17.

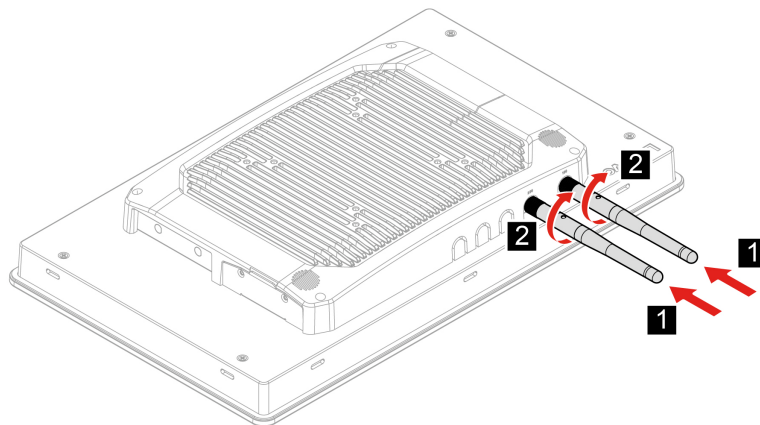
Removal steps

1. Remove the external wireless LAN antennas.



Installation steps

1. Install the external wireless LAN antennas.



Bottom cover

Prerequisite

Before you start, read [Generic Safety and Compliance Notices](#), and print the following instructions.



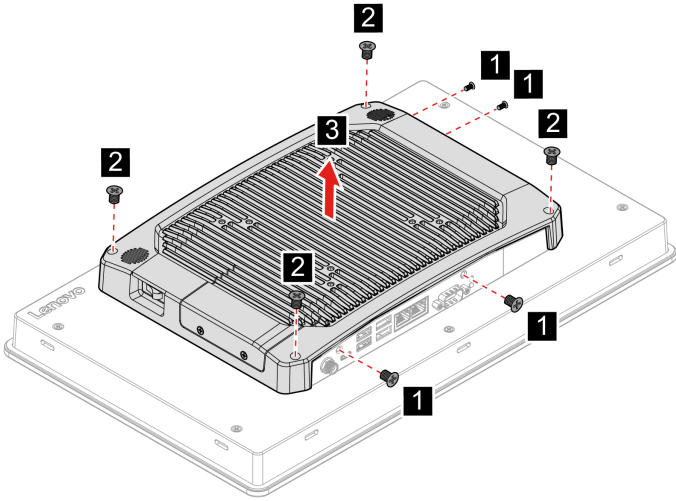
Avoid contact with the hot computer. During operation, the computer becomes hot enough to burn the skin. Before you touch the computer, turn off the computer, disconnect power, and wait approximately 30 minutes for the computer to cool.

For access, do the following:

1. Turn off all connected devices and the computer.
2. Disconnect all power cords from electrical outlets and disconnect all cables from the computer.
3. Unlock any locking device that secures the computer cover.
4. Remove the bracket, if any. See [Mount on wall](#) on page 17.
5. Turn over the computer so that the bottom cover is facing up.

Removal steps

1. Unfasten the bottom cover by removing the side screws and the top screws.

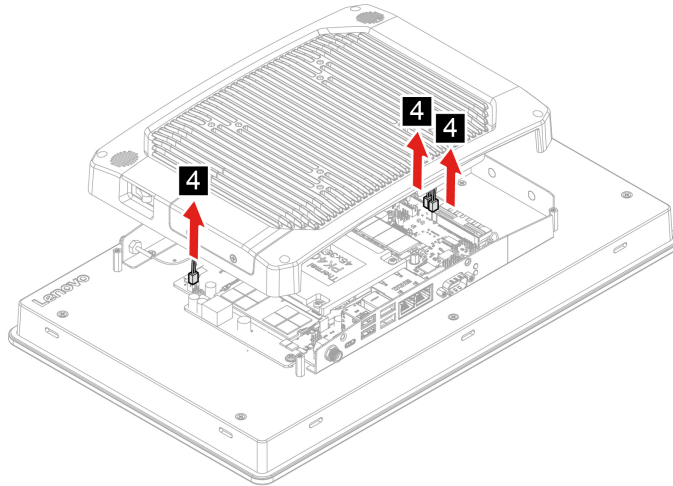


Attention:

Use the screws provided by Lenovo to avoid any unpredictable damage to your computer.

Screw (quantity)	Color	Torque (kgf-cm)
M3 × L6 mm, flat-head (10)	Black	3.6–4.4

2. Disconnect the internal cables to safely separate the bottom cover, and then remove the cover.



M.2 solid-state drives

Prerequisite

Before you start, read [Generic Safety and Compliance Notices](#), and print the following instructions.



Avoid contact with the hot computer. During operation, the computer becomes hot enough to burn the skin. Before you touch the computer, turn off the computer, disconnect power, and wait approximately 30 minutes for the computer to cool.



Attention:

The internal storage drive is sensitive. Inappropriate handling might cause damage and permanent loss of data. When handling the internal storage drive, observe the following guidelines:

- Replace the internal storage drive only for repair. The internal storage drive is not designed for frequent changes or replacement.
- Before replacing the internal storage drive, make a backup copy of all the data that you want to keep.
- Do not touch the contact edge of the internal storage drive. Otherwise, the internal storage drive might get damaged.
- Do not apply pressure to the internal storage drive.
- Do not make the internal storage drive subject to physical shocks or vibration. Put the internal storage drive on a soft material, such as cloth, to absorb physical shocks.

For access, do the following:

1. Turn off all connected devices and the computer.
2. Disconnect all power cords from electrical outlets and disconnect all cables from the computer.
3. Remove the bottom cover. See [Bottom cover](#) on page 50.

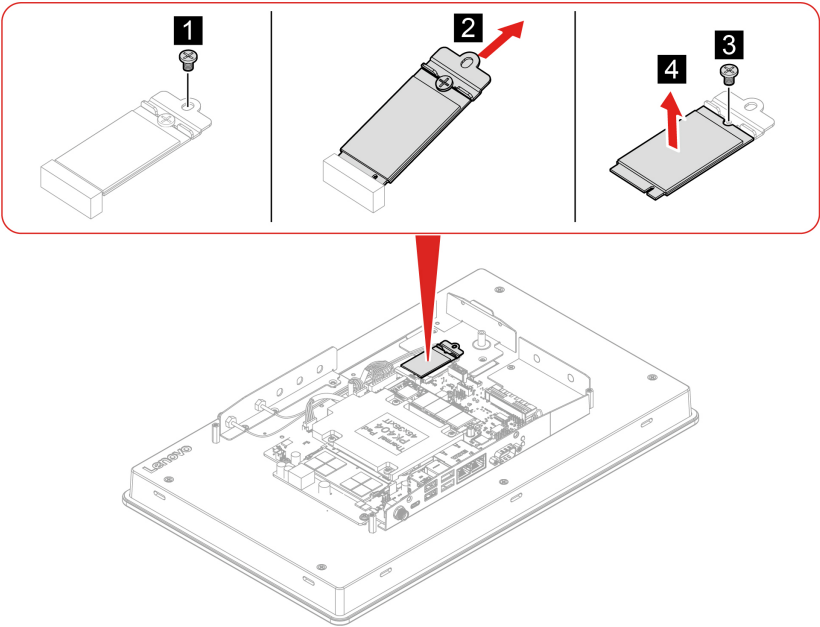
Type 1: 2242 SATA SSD

Removal steps:

- 1. Remove 10 screws to release the bottom cover and remove it.
- 2. Remove the M.2 2242 SATA SSD.

Note:

After installing the new M.2 2242 SATA SSD, ensure that you attach the new thermal pad to the new M.2 2242 SATA SSD



Attention:

Use the screws provided by Lenovo to avoid any unpredictable damage to your computer.

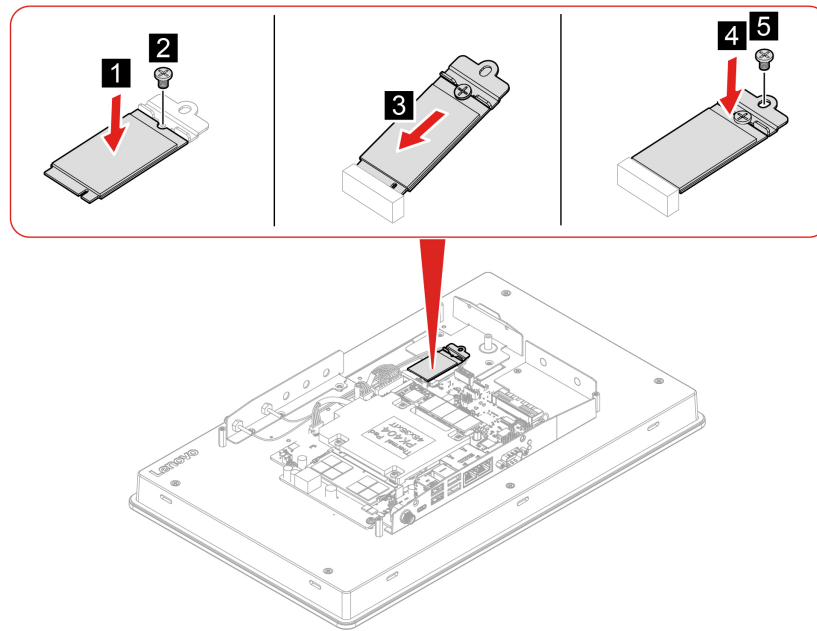
Screw (quantity)	Color	Torque (kgf-cm)
M3 × L4 mm, binding head (1)	Silver	3-3.3

Installation steps:

- 1. Install the M.2 2242 SATA SSD.

Note:

After installing the new M.2 2242 SATA SSD, ensure that you attach the new thermal pad to the new M.2 solid-state drive.



Attention:

Use the screws provided by Lenovo to avoid any unpredictable damage to your computer.

Screw (quantity)	Color	Torque (kgf-cm)
M3 × L4 mm, binding head (1)	Silver	3-3.3

2. Place the bottom cover and install 10 screws to secure it.

Type 2: 2280 PCIe SSD

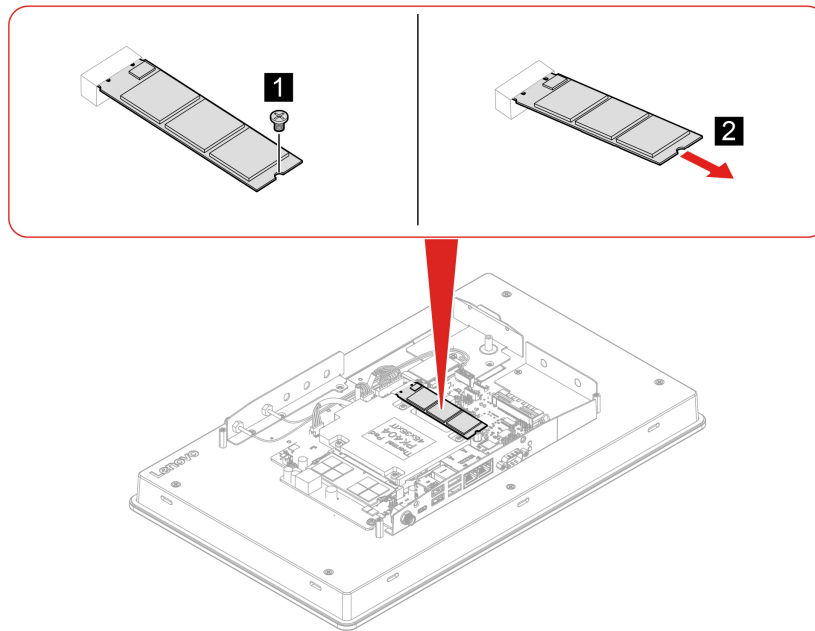
Removal steps:

1. Remove 10 screws to release the bottom cover and remove it.
2. Remove the M.2 2280 PCIe SSD.



Note:

A thermal pad might cover the M.2 2280 PCIe SSD. To access the M.2 2280 PCIe SSD, peel off the thermal pad first.



Attention:

Use the screws provided by Lenovo to avoid any unpredictable damage to your computer.

Screw (quantity)	Color	Torque (kgf-cm)
M3 × L4 mm, binding head (1)	Silver	3-3.3

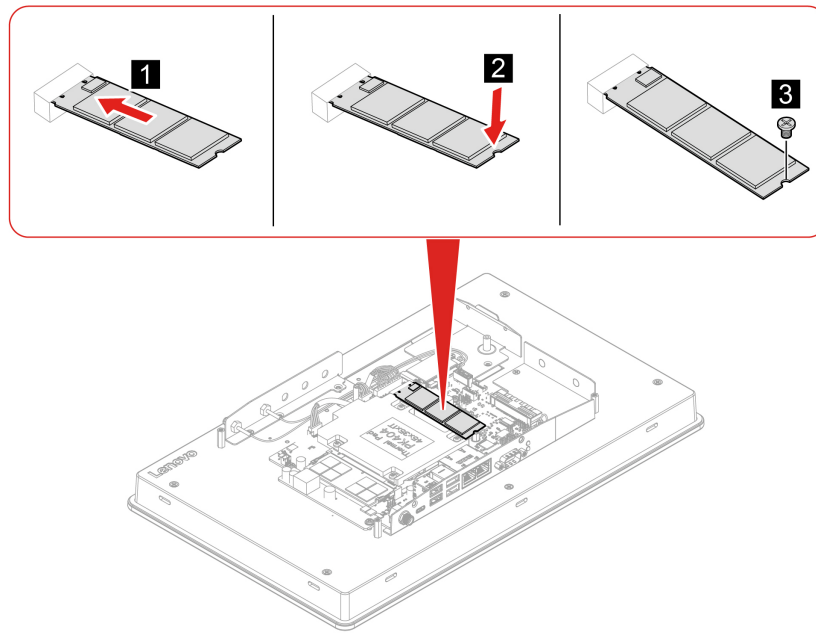
Installation steps:

1. Install the M.2 2280 PCIe SSD.



Note:

After installing the new M.2 2280 PCIe SSD, ensure that you attach the new thermal pad to the new M.2 2280 PCIe SSD.



Attention:

Use the screws provided by Lenovo to avoid any unpredictable damage to your computer.

Screw (quantity)	Color	Torque (kgf-cm)
M3 × L4 mm, binding head (1)	Silver	3–3.3

2. Place the bottom cover and install 10 screws to secure it.

Memory

Prerequisite

Before you start, read [Generic Safety and Compliance Notices](#), and print the following instructions.



Avoid contact with the hot computer. During operation, the computer becomes hot enough to burn the skin. Before you touch the computer, turn off the computer, disconnect power, and wait approximately 30 minutes for the computer to cool.

**Attention:**

The internal storage drive is sensitive. Inappropriate handling might cause damage and permanent loss of data. When handling the internal storage drive, observe the following guidelines:

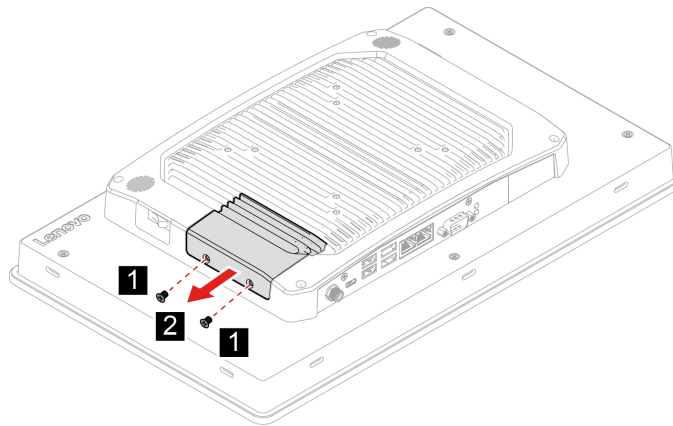
- Replace the internal storage drive only for repair. The internal storage drive is not designed for frequent changes or replacement.
- Before replacing the internal storage drive, make a backup copy of all the data that you want to keep.
- Do not touch the contact edge of the internal storage drive. Otherwise, the internal storage drive might get damaged.
- Do not apply pressure to the internal storage drive.
- Do not make the internal storage drive subject to physical shocks or vibration. Put the internal storage drive on a soft material, such as cloth, to absorb physical shocks.

For access, do the following:

1. Turn off all connected devices and the computer.
2. Disconnect all power cords from electrical outlets and disconnect all cables from the computer.

Removal steps:

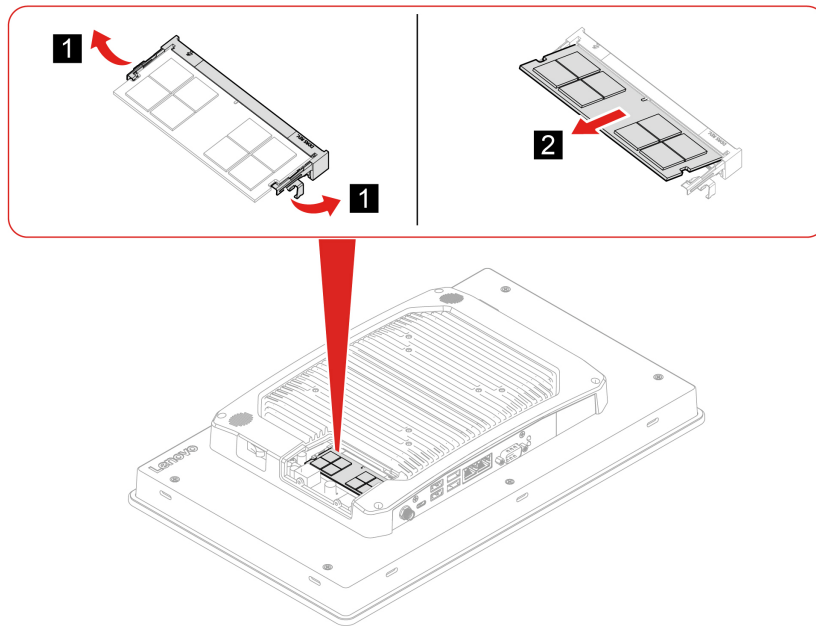
1. Remove the two screws to release the side cover and remove it.



2. Remove the DDR5 memory.

**Note:**

A thermal pad might cover the memory. To access the memory, peel off the thermal pad first.

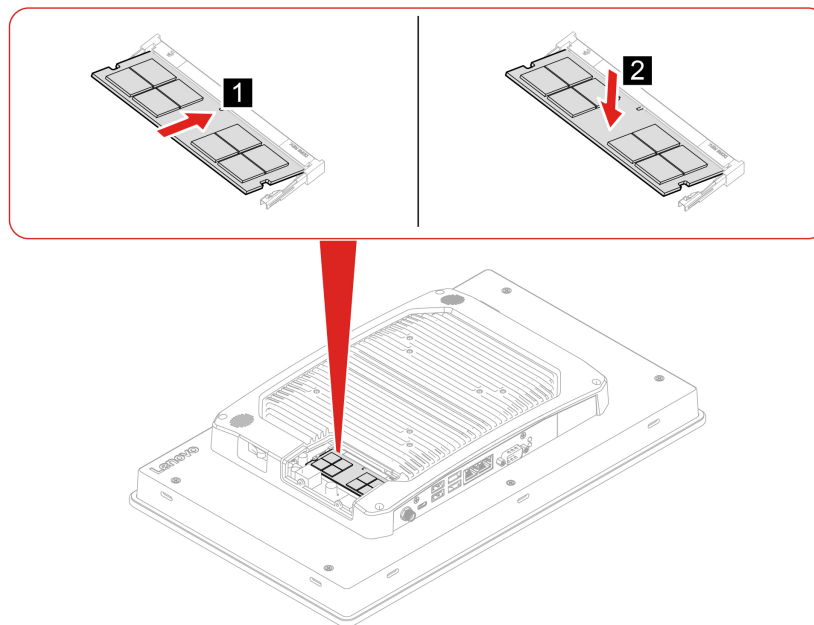


Installation steps:

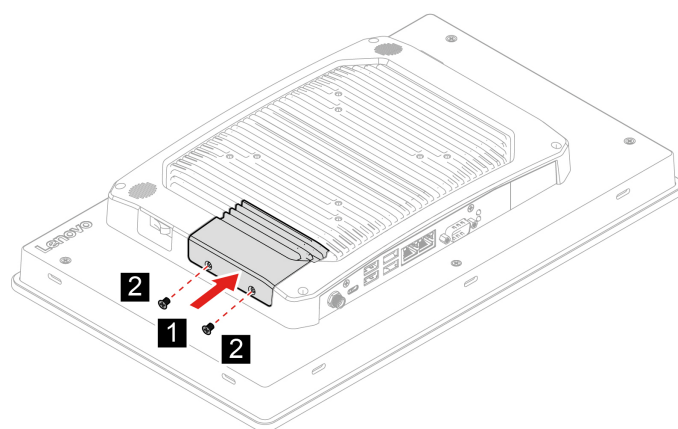
1. Insert the DDR5 memory into the memory socket.

Note:

After installing the new memory, ensure that you attach the new thermal pad to the new memory.



2. Re-assemble the side cover back.



Chapter 8 Help and support

Self-help resources

Use the following self-help resources to learn more about the computer and troubleshoot problems.

Resources	How to access?
Product documentation: • <i>Safety and Warranty Guide</i> • <i>Setup Guide</i> • <i>This User Guide</i> • <i>Regulatory Notice</i>	Go to https://smartsupport.lenovo.com . Then, follow the on-screen instructions to filter out the documentation you want.
Lenovo Support Web site with the latest support information of the following: • Drivers and software • Diagnostic solutions • Product and service warranty • Product and parts details • Knowledge base and frequently asked questions	https://smartsupport.lenovo.com
Windows help information	• Use Windows Search. • Microsoft support Web site: https://support.microsoft.com

Call Lenovo

If you have tried to correct the problem yourself and still need help, you can call Lenovo Customer Support Center.

Before you contact Lenovo

Prepare the following before you contact Lenovo:

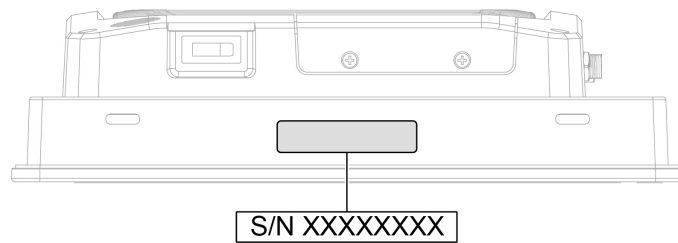
1. Record the problem symptoms and details:

- What is the problem? Is it continuous or intermittent?
- Any error message or error code?
- What operating system are you using? Which version?
- Which software applications were running at the time of the problem?
- Can the problem be reproduced? If so, how?

2. Record the system information:

- Product name
- Machine type and serial number

The following illustration shows where to find the machine type and serial number of your computer.



Lenovo Customer Support Center

During the warranty period, you can call Lenovo Customer Support Center for help.

Telephone numbers

For a list of the Lenovo Support phone numbers for your country or region, go to:

<https://smartsupport.lenovo.com/supportphonelist>

i Note:

Phone numbers are subject to change without notice. If the number for your country or region is not provided, contact your Lenovo reseller or Lenovo marketing representative.

Services available during the warranty period

- Problem determination - Trained personnel are available to assist you with determining if you have a hardware problem and deciding what action is necessary to fix the problem.
- Lenovo hardware repair - If the problem is determined to be caused by Lenovo hardware under warranty, trained service personnel are available to provide the applicable level of service.
- Engineering change management - Occasionally, there might be changes that are required after a product has been sold. Lenovo or your reseller, if authorized by Lenovo, will make selected Engineering Changes (ECs) that apply to your hardware available.

Services not covered

- Replacement or use of parts not manufactured for or by Lenovo or nonwarranted parts
- Identification of software problem sources
- Configuration of UEFI BIOS as part of an installation or upgrade
- Changes, modifications, or upgrades to device drivers
- Installation and maintenance of network operating systems (NOS)
- Installation and maintenance of programs

For the terms and conditions of the Lenovo Limited Warranty that apply to your Lenovo hardware product, see *Safety and Warranty Guide* that comes with your computer.

Purchase accessories

Lenovo has a number of hardware accessories and upgrades to help expand the capabilities of your computer. Options include memory modules, storage devices, network cards, power adapters, keyboards, mice, and more.

To shop at Lenovo, go to <https://www.lenovo.com/accessories>.

Purchase additional services

During and after the warranty period, you can purchase additional services from Lenovo at:

<https://smartsupport.lenovo.com/warrantyupgrade>

Service availability and service name might vary by country or region.

Appendix A Important notice for Quebec consumers

In regard to section 79.18 of Quebec's Regulation respecting the application of the Consumer Protection Act, Lenovo in no way guarantees the availability of (a) replacement parts; (b) repair services; and (c) information necessary to maintain or repair the goods. For up-to-date information on the technical support and parts available for your purchase, please consult <https://support.lenovo.com/ca/en>

En ce qui concerne l'article 79.18 du Règlement d'application de la Loi sur la protection du consommateur du Québec, Lenovo ne garantit en aucune façon la disponibilité des éléments suivants: (a) les pièces de rechange; (b) les services de réparation; et (c) les renseignements nécessaires à l'entretien à la réparation du bien. Pour obtenir des renseignements à jour sur le soutien technique et les pièces disponibles pour votre achat, veuillez consulter <https://support.lenovo.com/ca/fr>.

Appendix B Notice for USB connector name update

The USB Implementers Forum published a revision of the guideline for USB connector names in September, 2022. Lenovo follows the revised guideline and updates USB connector names accordingly. You can refer to the table below for naming update details.

Current name	Previous name
USB-A connector (Hi-Speed USB)	USB-A 2.0 connector
USB-A connector (USB 5Gbps)	USB-A 3.2 Gen 1 connector
USB-A connector (USB 10Gbps)	USB-A 3.2 Gen 2 connector
USB-A connector (USB 5Gbps, Always On USB)	Always on USB-A 3.2 Gen 1 connector
USB-A connector (USB 10Gbps, Always On USB)	Always on USB-A 3.2 Gen 2 connector
USB-C connector (USB 5Gbps)	USB-C (3.2 Gen 1) connector
USB-C connector (USB 10Gbps)	USB-C (3.2 Gen 2) connector
USB-C connector (USB 20Gbps)	USB 3.2 Gen 2x2
USB-C connector (USB4 20Gbps)	USB 4 Gen 2x2
USB-C connector (USB4 40Gbps)	USB-C (USB 4) connector
USB-C connector (Thunderbolt 3)	USB-C (Thunderbolt 3) connector
USB-C connector (Thunderbolt 4)	USB-C (Thunderbolt 4) connector

Appendix C Notices and trademarks

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8001 Development Drive

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