

Hardware Maintenance Manual

Lenovo
ThinkSmart



Lenovo

ThinkSmart Core Gen 2

First Edition (December 2024)

© Copyright Lenovo 2024.

LIMITED AND RESTRICTED RIGHTS NOTICE: If data or software is delivered pursuant to a General Services Administration "GSA" contract, use, reproduction, or disclosure is subject to restrictions set forth in Contract No. GS-35F-05925.

Contents

| | |
|------------------------------------|-------------|
| About this manual | .iii |
|------------------------------------|-------------|

| | |
|--|----------|
| Chapter 1. Product overview | 1 |
|--|----------|

| | |
|-----------------|---|
| Front | 1 |
| Rear | 1 |
| Left | 2 |
| Right | 2 |

| | |
|---|----------|
| Chapter 2. Service checkout and symptom-to-FRU index | 3 |
|---|----------|

| | |
|--------------------------------------|---|
| Service checkout | 3 |
| Problem determination tips | 3 |
| Symptom-to-FRU index | 4 |
| Power supply problems | 4 |
| POST error codes | 5 |

| | |
|---|----------|
| Chapter 3. Hardware removal and installation | 7 |
|---|----------|

| | |
|--|----|
| Handling static-sensitive devices | 7 |
| Service tool kit | 7 |
| Major FRUs and CRUs | 9 |
| System board and I/O board assembly and USB board illustration | 12 |
| Removing and installing hardware | 13 |
| External options | 13 |

| | |
|--|----|
| Power adapter, power cord, and power adapter cage | 14 |
| VESA mount brackets and screws | 15 |
| Cable management top cover and bottom cover | 16 |
| Top cover assembly | 18 |
| Memory modules and thermal pads | 18 |
| 60-pin signal main cable | 20 |
| M.2 solid-state drive and thermal pad | 21 |
| Wi-Fi card and shield | 22 |
| 50-pin signal slave cable | 23 |
| System board and I/O board assembly, heat sink, system fan, and step screw kits. | 24 |
| CMOS battery | 27 |
| I/O power cable | 28 |
| USB board and cable | 29 |

| | |
|--|-----------|
| Chapter 4. Help and support | 31 |
|--|-----------|

| | |
|--|----|
| Self-help resources | 31 |
| Additional services | 31 |
| Call Lenovo | 31 |
| Before you contact Lenovo | 31 |
| Lenovo Customer Support Center | 32 |

| | |
|--|-----------|
| Appendix A. Notices and trademarks. | 33 |
|--|-----------|

About this manual

This manual provides service and reference information for ThinkSmart® devices listed on the front cover.

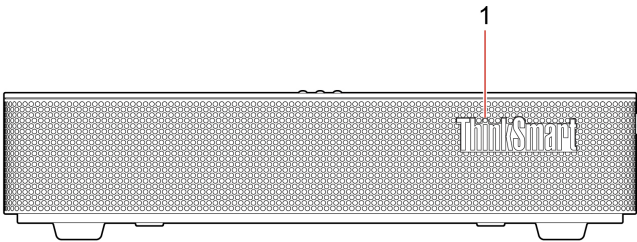
Illustrations in this manual might look different from your product.

Use this manual along with the advanced diagnostic tests to troubleshoot problems.

Important: This manual is intended only for trained service technicians who are familiar with ThinkSmart devices. Use this manual along with the advanced diagnostic tests to troubleshoot problems effectively. Before servicing a ThinkSmart device, be sure to read and understand *Generic Safety and Compliance Notices* at <https://smartsupport.lenovo.com>.

Chapter 1. Product overview

Front



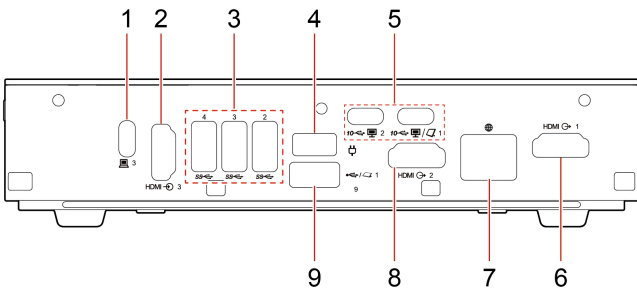
| Item | Description |
|------|-----------------|
| 1 | ThinkSmart® LED |

ThinkSmart LED

Show the system status of your device.

- **On:** The device is starting up or working.
- **Off:** The device is off.

Rear



| Item | Description | Item | Description |
|------|--|------|---------------------|
| 1 | Bring Your Own Meeting (BYOM) connector* | 2 | HDMI™-in connector* |
| 3 | USB-A connectors (USB 5Gbps) (with BYOM) | 4 | Power connector |
| 5 | USB-C® connectors (USB 10Gbps) | 6 | HDMI-out connector |
| 7 | Ethernet connector (1000Mbps) | 8 | HDMI-out connector |
| 9 | USB-A connector (Hi-Speed USB) (with smart power-on) | | |

* for selected models

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 the connector name for each corresponding device.

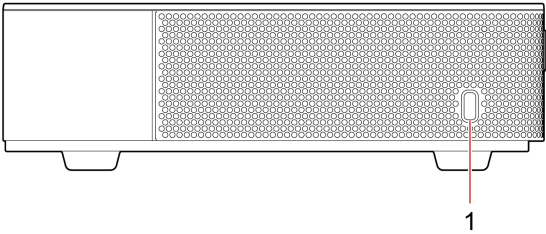
HDMI-in connector

Support up to 3840 x 2160 @ 60 Hz.

HDMI-out connector

Support up to 3840 x 2160 @ 60 Hz.

Left



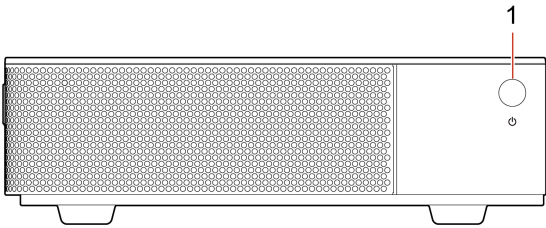
| Item | Description |
|------|--------------------|
| 1 | Security-lock slot |

Security-lock slot

Lock your device to a desk, table, or other fixtures through a security lock.

Note: Lenovo makes no comments, judgments, or warranties about the function, quality, or performance of the locking device and security feature. You can purchase security locks from Lenovo.

Right



| Item | Description |
|------|--------------|
| 1 | Power button |

Chapter 2. Service checkout and symptom-to-FRU index

This chapter provides information about general service checkout and symptom-to-FRU index.

Service checkout

Attention: The drives in the device you are servicing might have been rearranged or the drive startup sequence changed. Be extremely careful during write operations such as copying, saving, or formatting. Data or programs can be overwritten if you select an incorrect drive.

General error messages appear if a problem or conflict is found by a program, the operating system, or both. For an explanation of these messages, refer to the information supplied with that software package.

Use the following procedure to help determine the cause of the problem:

1. Turn off the device and all external devices.
2. Check all cables and power cords.
3. Set all display controls to the middle position.
4. Turn on all external devices.
5. Turn on the device.
 - Look for displayed error codes.
 - Look for readable instructions or a main menu on the display.

If you *did not* receive the correct response, proceed to step 6 on page 3.

If you *do* receive the correct response, proceed to step 7 on page 3.
6. Look at the following conditions and follow the instructions:
 - If the device displays a POST error, go to “POST error codes” on page 5.
 - If the device hangs and no error is displayed, continue at step 7 on page 3.
7. Run the Diagnostic programs.
 - If you receive an error, replace the part that the diagnostic program calls out.
 - If the test stops and you cannot continue, replace the last device tested.

Problem determination tips

Due to the variety of hardware and software combinations that can be encountered, use the following information to assist you in problem determination. If possible, have this information available when requesting assistance from Service Support and Engineering functions.

- Machine type and model
- Processor or hard disk drive upgrades
- Failure symptom
 - Do diagnostics indicate a failure?
 - What, when, where, single, or multiple systems?
 - Is the failure repeatable?
 - Has this configuration ever worked?
 - If it has been working, what changes were made prior to its failing?
 - Is this the original reported failure?

- Diagnostics version
 - Type and version level
- Hardware configuration
 - Print (print screen) configuration currently in use
 - BIOS level
- Operating system software
 - Type and version level

Notes: To eliminate confusion, identical systems are considered identical only if they:

1. Are the exact machine types and models
2. Have the same BIOS level
3. Have the same adapters/attachments in the same locations
4. Have the same address jumpers/terminators/cabling
5. Have the same software versions and levels
6. Have the same Diagnostic Diskettes (version)
7. Have the same configuration options set in the system
8. Have the same setup for the operating system control files

Comparing the configuration and software set-up between “working and non-working” systems will often lead to problem resolution.

Symptom-to-FRU index

The Symptom-to-FRU index lists error symptoms and possible causes. The most likely cause is listed first. Always begin with “Service checkout” on page 3. This index can also be used to help you decide which FRUs to have available when servicing a device.

Notes:

- The Symptom-to-FRU index is not specific to any machine type and are applicable to all devices.
- If you have both an error message and an incorrect audio response, diagnose the error message first.
- If you cannot run the diagnostic tests or you get a diagnostic error code when running a test, but did receive a POST error message, diagnose the POST error message first.
- If you did not receive any error message, look for a description of your error symptoms in the first part of this index.

Power supply problems

If you suspect a power problem, use the following procedures.

| Check/Verify | FRU/Action |
|---|-------------------|
| Check the following for proper installation. <ul style="list-style-type: none"> • Power cord • On/Off switch connector • On/Off switch power supply connector • System board power supply connectors • Microprocessor connection | Reseat connectors |
| Check the power cord for continuity. | Power cord |
| Check the power-on switch for continuity. | Power-on switch |

POST error codes

Each time you turn on the system, it performs a series of tests that check the operation of the system and some options. This series of tests is called the *Power-On Self-Test*, or *POST*. POST checks the following operations:

- Some basic system-board operations
- Memory operation
- Video operation
- Whether the boot drive is working

If the POST detects a problem, an error message appears on the screen. A single problem might cause several error messages to appear. When you correct the cause of the first error message, the other error messages probably will not appear on the screen the next time.

| Error code | POST error message | Description/Action |
|------------|---|---|
| 0135 | CPU fan failure System fan failure Power fan failure Front fan failure Rear fan failure Auxiliary fan failure ODD fan failure | This error message is displayed when a fan fails and the system might be overheating. Press F10 to exit. |
| 0162 | Setup data integrity check failure | This error indicates the checksum of BIOS Setup data in NVRAM is bad. In BIOS Setup, the "Save Changes and Exit" operation is needed in order to clear this error. |
| 0164 | Memory configuration change has occurred | This error message is displayed when the memory size is changed. Press F10 to exit. |
| 1762 | Storage device configuration change has occurred | This error message is displayed when a hard disk drive change or an optical drive change has been made. Press F10 to exit. |

| Error code | POST error message | Description/Action |
|------------|--|--|
| 8998 | Not enough shadow RAM resources for OPTION ROM, not all devices initialized. Suggest removing some add-on cards, or changing to UEFI mode in BIOS setup. | <p>This error message is displayed when the shadow RAM resources for option ROM are insufficient.</p> <p>If the legacy option ROM is insufficient, remove some add-in cards.</p> <p>For the system that supports UEFI, set UEFI as the first priority.</p> |
| 8999 | Not enough PCIe/PCI MMIO resources. Currently only one video card is enabled. Remove some PCIe cards. | <p>This error message is displayed when the PCIe/PCI MMIO (memory mapped input/output) resources are insufficient.</p> <p>Remove some add-in cards.</p> |

Chapter 3. Hardware removal and installation

This chapter provides instructions on how to remove and install hardware for your device.

Handling static-sensitive devices

Do not open the static-protective package containing the new part until the defective part has been removed and you are ready to install the new part. Static electricity, although harmless to you, can seriously damage device components and options.

When you handle options and other device components, take these precautions to avoid static-electricity damage:

- Limit your movement. Movement can cause static electricity to build up around you.
- Always handle options and other device components carefully. Handle PCI/PCIe cards, memory modules, system boards, and microprocessors by the edges. Never touch any exposed circuitry.
- Prevent others from touching the options and other device components.
- Touch the static-protective package containing the part to a metal expansion-slot cover or other unpainted metal surface on the device for at least two seconds. This reduces static electricity from the package and your body before you install or replace a new part.
- When possible, remove the new part from the static-protective package, and install it directly in the device without setting the part down. When this is not possible, place the static-protective package on a smooth, level surface and place the part on the package.
- Do not place the part on the device cover or other metal surface.

Service tool kit

Ensure that the following common service tool kit is prepared before you service the device.

| No. | Tool name | Specification | Product scope | Tool type |
|-----|-------------------------------|---------------------------------------|--------------------|-------------|
| 1 | Screwdriver: Phillips Head 0 | PH0 | All | Common tool |
| 2 | Screwdriver: Phillips Head 00 | PH00 | All | Common tool |
| 3 | Screwdriver: Phillips Head 01 | 1 | All | Common tool |
| 4 | Screwdriver: Phillips Head 01 | 1, Shank length greater than 6 inches | ThinkStation/DT | Common tool |
| 5 | Screwdriver: Phillips Head 02 | 2, Shank length greater than 6 inches | ThinkStation/SC/DT | Common tool |
| 6 | Screwdriver: Torx Head T5 | T5 | IdeaPad | Common tool |

| No. | Tool name | Specification | Product scope | Tool type |
|-----|--|--|------------------|-------------|
| 7 | Screwdriver: Torx Head T15 | T15, for Chassis outside | ThinkStation | Common tool |
| 8 | Screwdriver: Torx Head T20 | T20, Shank length greater than 6 inches, for heatsink and CPU | ThinkStation | Common tool |
| 9 | Screwdriver: Torx Head T30 | T30, Shank length greater than 6 inches, for heatsink and CPU | ThinkStation | Common tool |
| 10 | Pry tools 1 | N/A | All | Common tool |
| 11 | Tweezers (conductive) | N/A | All | Common tool |
| 12 | Tweezers (isolated) | N/A | All | Common tool |
| 13 | Suction cup | N/A | All | Common tool |
| 14 | Hexagonal socket (for VGA) | H5 mm or 4.8 mm | ThinkCentre/Tiny | Common tool |
| 15 | Hexagonal socket (for Tinyantenna) | H8 mm | ThinkCentre/Tiny | Common tool |
| 16 | Ajustable Torque Screwdriver | 0.2 Nm to 4.0 Nm, Threadripper CPU, CAMM, etc | All | Common tool |
| 17 | ESD Mat | ESD Mat | All | Common tool |
| 18 | USB Flash Drives | For Golden Key, Chrome Reloads, AutoPilot, etc | All | Common tool |
| 19 | USB-C to USB-A Converter | For USB-C only systems | All | Common tool |
| 20 | SSD/WWAN/IC Thermal pad | Thermal pads are typically used under the SSD/WWAN/IC in different thicknesses, the most common being 0.5 mm. | All | Consumable |
| 21 | Silicone grease for CPU or heatsink repairing | N/A | All | Consumable |
| 22 | Polyamide tape | N/A | All | Consumable |

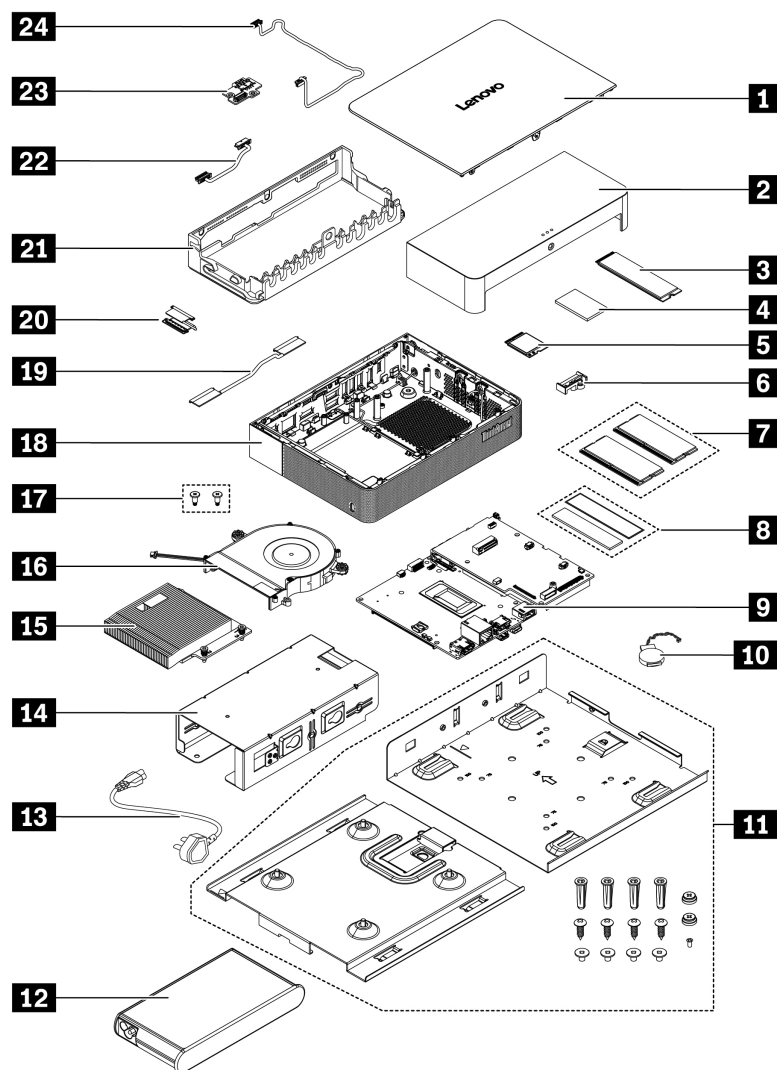
| No. | Tool name | Specification | Product scope | Tool type |
|-----|-----------------------|---|---|------------------------------|
| 23 | Mylar tape | N/A | All | Consumable |
| 24 | Eraser | N/A | All | Consumable |
| 25 | Electrical tape | N/A | All | Consumable |
| 26 | Double sided tape | N/A | All | Consumable |
| 27 | Conductive tape | N/A | All | Consumable |
| 28 | Cleaning pads/wipes | N/A | All | Consumable |
| 29 | Heat gun | N/A | All | Special Tool (Depot only) |
| 30 | Brown brush | 25 mm to 35 mm wide | All | Special tool |
| 31 | Contact Cleaner Spray | WD-40 Contact Cleaner for battery connector | ThinkPad X1 Carbon | Special tool |
| 32 | Hexagonal socket | 17 mm | Yoga AIO 7 27ACH6/ Yoga AIO 7 27ARH6 | Special tool |

Note: The silicone grease can be applied to the surfaces of the microprocessor and heat sink to eliminate air gaps. For parts with silicone grease applied, it is suggested that you apply new grease during the installation.

Major FRUs and CRUs

Your device contains the following types of CRUs and FRUs:

- **Self-service CRUs:** Refer to parts that can be replaced easily by customers 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.
- **FRUs:** Refer to parts that must be replaced only by trained service technicians. If customers choose to replace the FRUs by themselves, the product warranty might be affected.



| Number | Description | Self-service CRU | Optional-service CRU |
|-----------|-------------------------------------|------------------|----------------------|
| 1 | Top cover assembly | Yes | No |
| 2 | Cable management top cover* | Yes | No |
| 3 | M.2 solid-state drive | Yes | No |
| 4 | M.2 solid-state drive thermal pad | Yes | No |
| 5 | Wi-Fi card | No | No |
| 6 | Wi-Fi card shield | No | No |
| 7 | Memory modules | Yes | No |
| 8 | Memory module thermal pads | Yes | No |
| 9 | System board and I/O board assembly | No | No |
| 10 | CMOS battery | No | No |
| 11 | VESA® mount brackets and screws* | Yes | No |
| 12 | Power adapter | Yes | No |

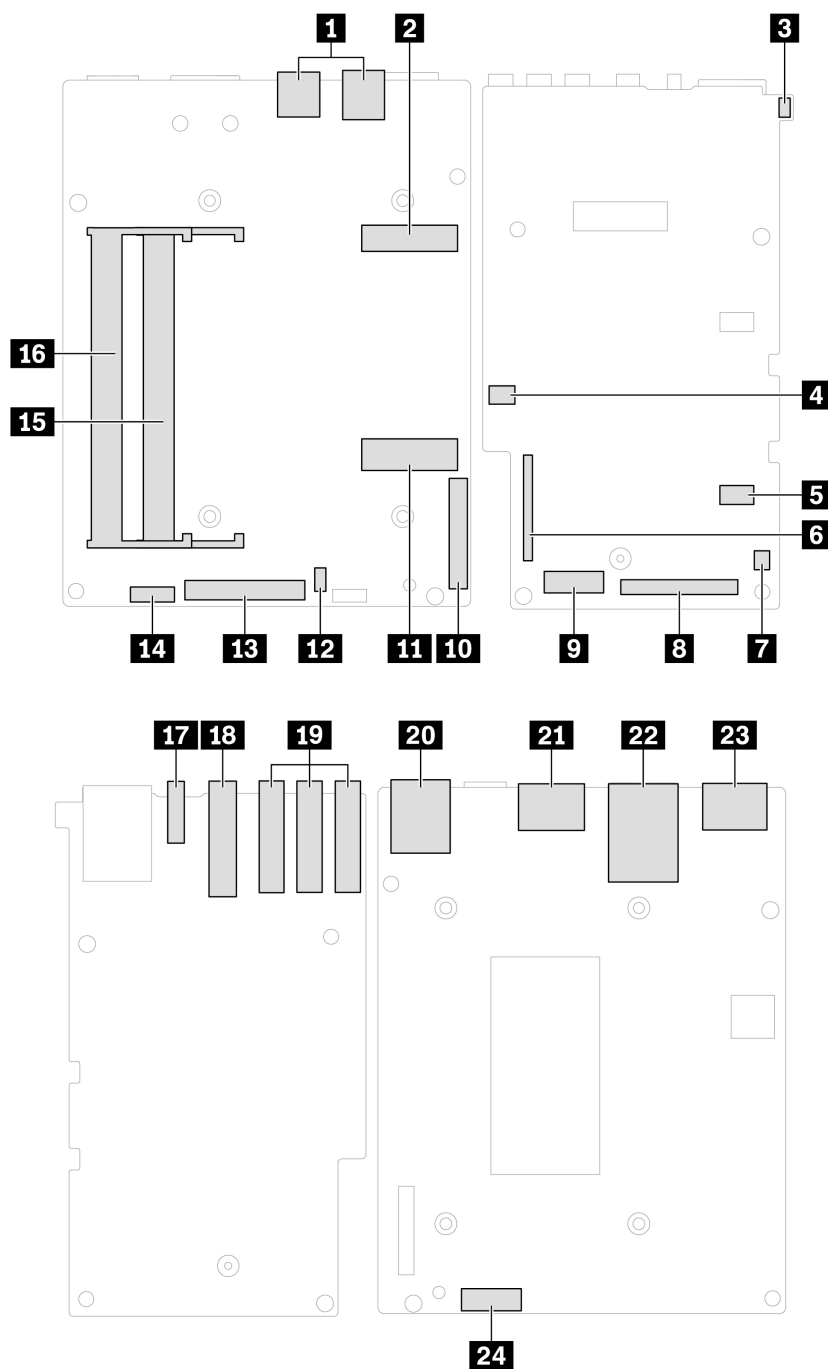
| Number | Description | Self-service CRU | Optional-service CRU |
|-----------|--------------------------------|------------------|----------------------|
| 13 | Power cord | Yes | No |
| 14 | Power adapter cage* | Yes | No |
| 15 | Heat sink | No | No |
| 16 | System fan | No | No |
| 17 | System fan step screw kits | No | No |
| 18 | Chassis assembly | No | No |
| 19 | 60-pin signal main cable | No | No |
| 20 | 50-pin signal slave cable* | No | No |
| 21 | Cable management bottom cover* | Yes | No |
| 22 | I/O power cable | No | No |
| 23 | USB board | No | No |
| 24 | USB board cable | No | No |

* for selected models

For detailed FRU and CRU information, such as the FRU part numbers and supported device models, go to:
<http://www.lenovo.com/serviceparts-lookup>

System board and I/O board assembly and USB board illustration

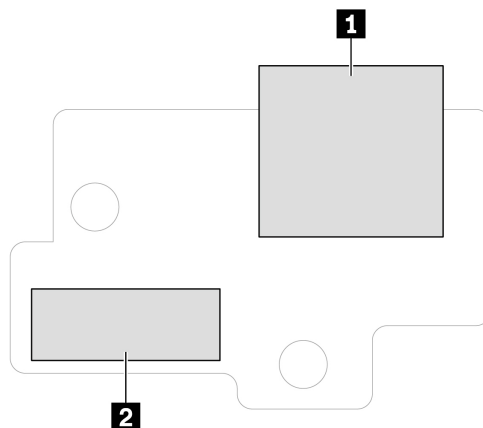
System board and I/O board assembly



| Item | Description | Item | Description |
|------|------------------|------|----------------------------|
| 1 | USB-C connectors | 2 | M.2 solid-state drive slot |
| 3 | Power button | 4 | System fan cable connector |

| Item | Description | Item | Description |
|-----------|---|-----------|--|
| 5 | LED cable connector | 6 | 50-pin signal slave cable connector |
| 7 | Intrusion switch | 8 | 60-pin signal main cable connector |
| 9 | I/O power cable connector | 10 | 50-pin signal slave cable connector |
| 11 | M.2 Wi-Fi card slot | 12 | Clear CMOS (Complementary Metal Oxide Semiconductor)/Recovery jumper |
| 13 | 60-pin signal main cable connector | 14 | USB board cable connector |
| 15 | Memory slot (DIMM1) | 16 | Memory slot (DIMM2) |
| 17 | Bring Your Own Meeting (BYOM) connector | 18 | HDMI-in connector |
| 19 | USB-A connectors | 20 | Power connector |
| 21 | HDMI-out connector | 22 | Ethernet connector |
| 23 | HDMI-out connector | 24 | I/O power cable connector |

USB board



| Item | Description | Item | Description |
|----------|-----------------|----------|---------------------------|
| 1 | USB-A connector | 2 | USB board cable connector |

Removing and installing hardware

This section provides instructions on how to remove and install hardware for your device.

Attention: Do not open your device or attempt any repair before reading and understanding the *Generic Safety and Compliance Notices* at <https://smartsupport.lenovo.com>.

External options

You can connect external options to your device, such as a keyboard, mouse, audio device, or camera. For some external options, you must install additional software in addition to making the physical connection. When installing an external option, see Chapter 1 “Product overview” on page 1 to identify the required connector. Then, use the instructions that come with the option to help you make the connection and install any required software or device drivers.

Power adapter, power cord, and power adapter cage

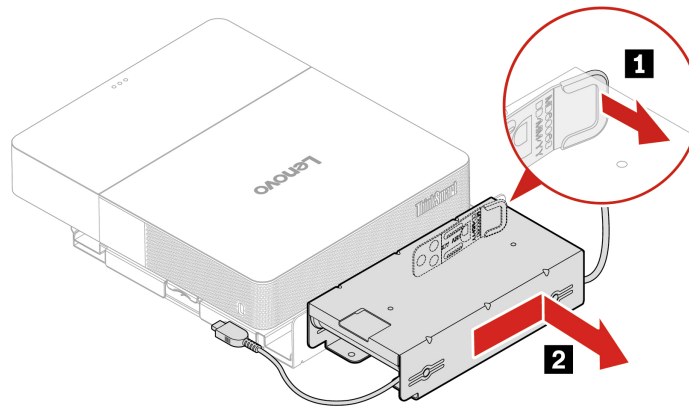
Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

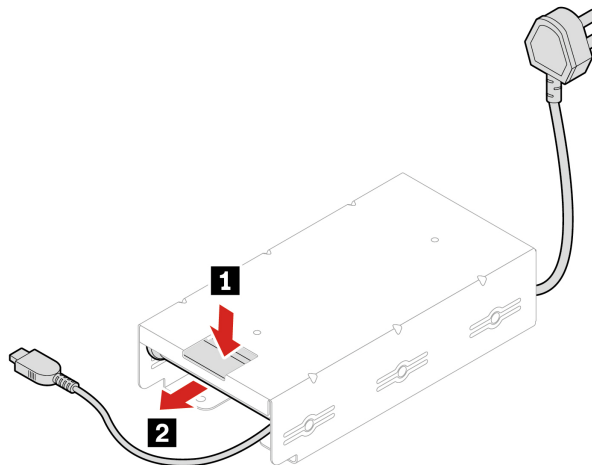
For access, do the following:

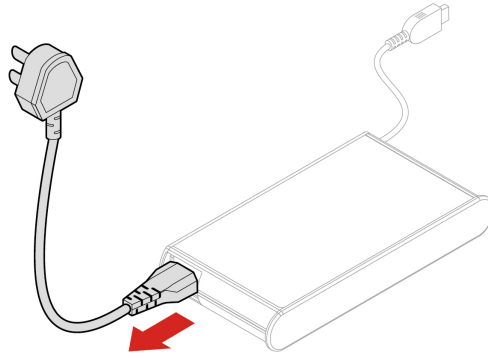
1. Turn off the device and remove all connected devices and cables.
2. Disconnect the device from ac power and all connected cables.

Removal steps



Note: Hold the latch in step **1** when removing the power adapter cage.





VESA mount brackets and screws

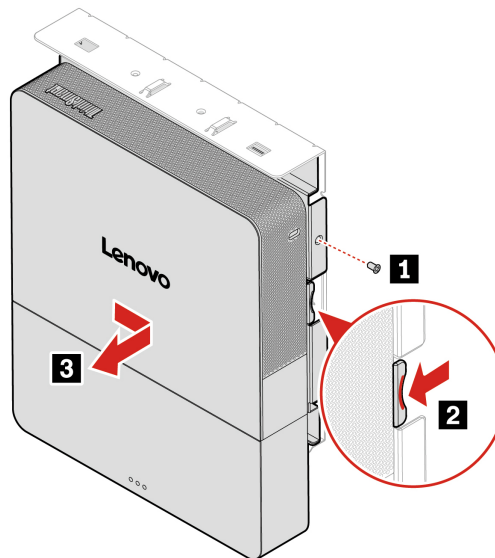
Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, do the following:

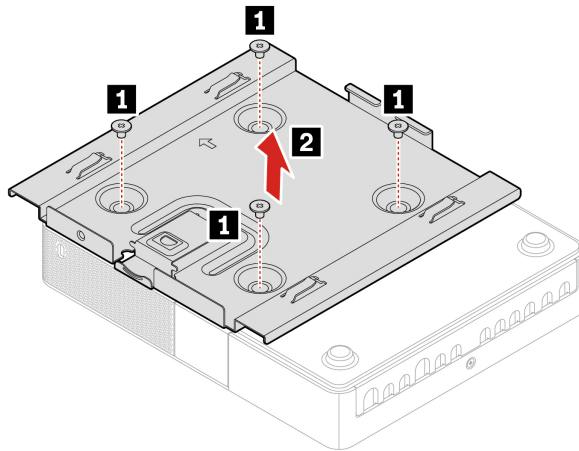
1. Turn off the device and remove all connected devices and cables.
2. Disconnect the device from ac power and all connected cables.
3. Unlock any locking device that secures the device.
4. Remove the power adapter cage, if any. See “Power adapter, power cord, and power adapter cage” on page 14

Removal steps

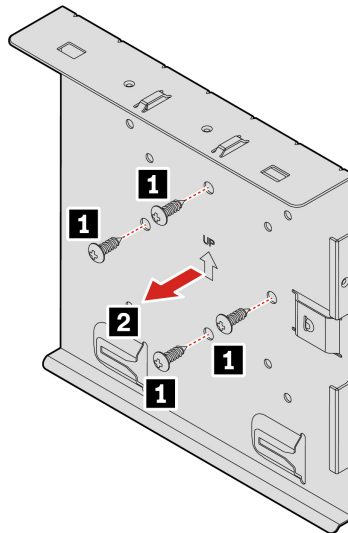


Note: Hold the latch in step **2** when removing the top bracket.

| Screw (quantity) | Color | Torque |
|----------------------------|-------|-----------------|
| M3 x 3.3 mm, Zn coated (1) | Black | 5.0 ± 0.5 lb/in |



| Screw (quantity) | Color | Torque |
|----------------------------|-------|-----------------|
| M4 x 5.8 mm, Ni coated (4) | Black | 5.0 ± 0.5 lb/in |



| Screw (quantity) | Color | Torque |
|---------------------------|-------|-----------------|
| M5 x 16 mm, Zn coated (4) | Black | 5.0 ± 0.5 lb/in |

Cable management top cover and bottom cover

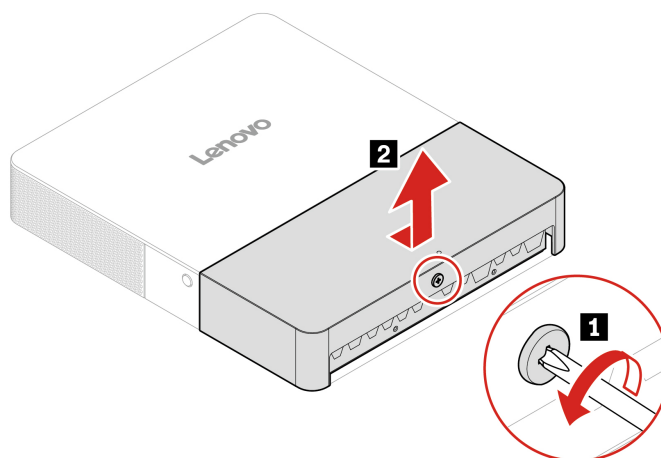
Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

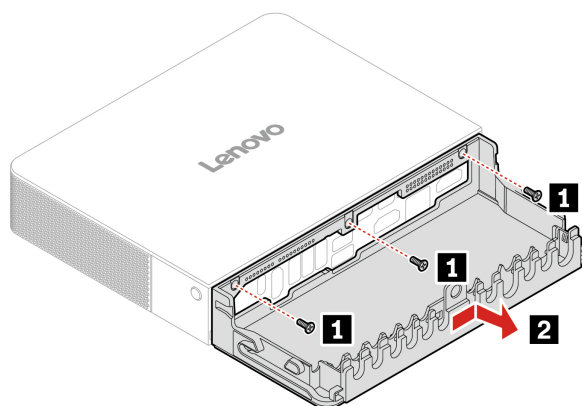
For access, do the following:

1. Turn off the device and remove all connected devices and cables.
2. Disconnect the device from ac power and all connected cables.
3. Unlock any locking device that secures the device.
4. Remove the following parts in order, if any:
 - “Power adapter, power cord, and power adapter cage” on page 14
 - “VESA mount brackets and screws” on page 15

Removal steps



| Screw (quantity) | Color | Torque |
|------------------------------|-------|-----------------|
| M2 x 2 + 8 mm, Zn coated (1) | Black | 1.2 ± 0.2 lb/in |



| Screw (quantity) | Color | Torque |
|----------------------------|-------|-----------------|
| M2 x 6.5 mm, Zn coated (3) | Black | 1.2 ± 0.2 lb/in |

Top cover assembly

Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

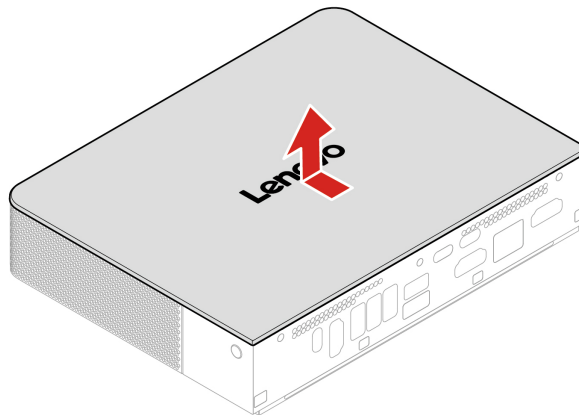


Before you open the device cover, turn off the device and wait several minutes until the device is cool.

For access, do the following:

1. Turn off the device and remove all connected devices and cables.
2. Disconnect the device from ac power and all connected cables.
3. Unlock any locking device that secures the device.
4. Remove the following parts in order, if any:
 - “Power adapter, power cord, and power adapter cage” on page 14
 - “VESA mount brackets and screws” on page 15
 - “Cable management top cover and bottom cover” on page 16

Removal step



Note: Ensure that the internal parts are installed correctly and the internal cables are routed correctly before installing the top cover assembly.

Memory modules and thermal pads

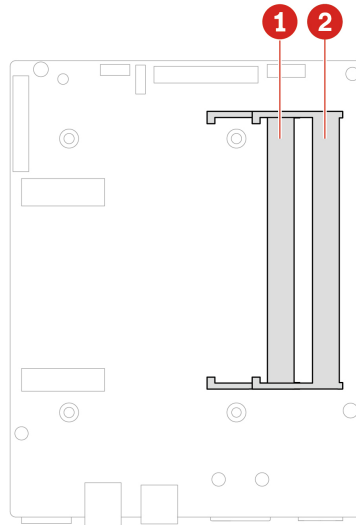
Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.



The heat sink might be very hot. Before you open the device cover, turn off the device and wait several minutes until the device is cool.

Ensure that you follow the installation order for memory modules shown in the following illustration.

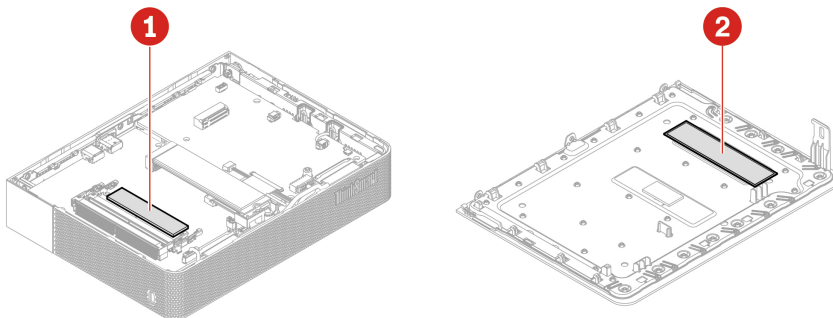


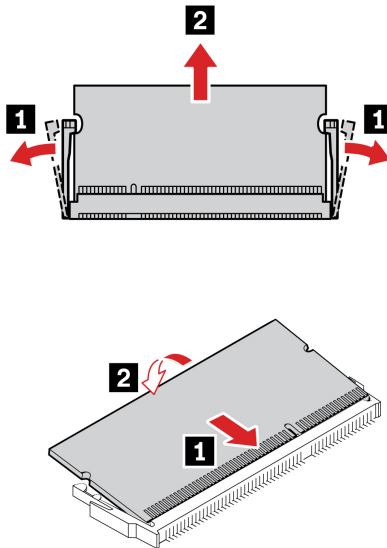
For access, do the following:

1. Turn off the device and remove all connected devices and cables.
2. Disconnect the device from ac power and all connected cables.
3. Unlock any locking device that secures the device.
4. Remove the following parts in order, if any:
 - “Power adapter, power cord, and power adapter cage” on page 14
 - “VESA mount brackets and screws” on page 15
 - “Cable management top cover and bottom cover” on page 16
 - “Top cover assembly” on page 18

Replacement procedures

Replace the thermal pad(s) according to the location of the memory module(s).





Note: When installing, remove the film that covers the thermal pad (if any).

60-pin signal main cable

Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

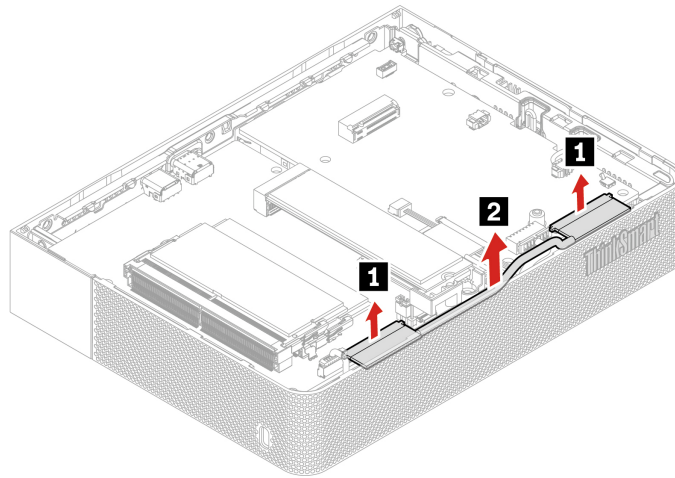


Before you open the device cover, turn off the device and wait several minutes until the device is cool.

For access, do the following:

1. Turn off the device and remove all connected devices and cables.
2. Disconnect the device from ac power and all connected cables.
3. Unlock any locking device that secures the device.
4. Remove the following parts in order, if any:
 - “Power adapter, power cord, and power adapter cage” on page 14
 - “VESA mount brackets and screws” on page 15
 - “Cable management top cover and bottom cover” on page 16
 - “Top cover assembly” on page 18

Removal steps



M.2 solid-state drive and thermal pad

Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.



The heat sink might be very hot. Before you open the device cover, turn off the device and wait several minutes until the device is cool.

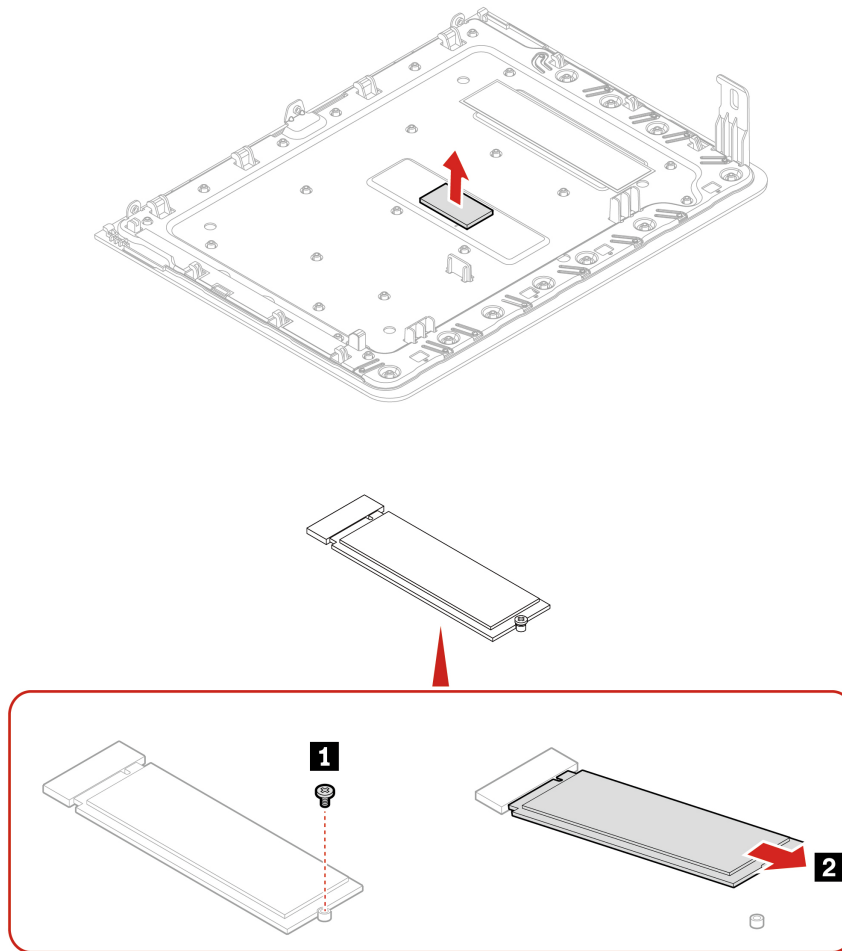
Attention: The internal storage drive is sensitive. Inappropriate handling might cause damage and permanent loss of data. When handling the internal storage drive, observe the following guidelines:

- 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 the device and remove all connected devices and cables.
2. Disconnect the device from ac power and all connected cables.
3. Unlock any locking device that secures the device.
4. Remove the following parts in order, if any:
 - “Power adapter, power cord, and power adapter cage” on page 14
 - “VESA mount brackets and screws” on page 15
 - “Cable management top cover and bottom cover” on page 16
 - “Top cover assembly” on page 18

Removal steps



| Screw (quantity) | Color | Torque |
|----------------------------|-------|-----------------|
| M2 x 6.5 mm, Zn coated (1) | Black | 1.5 ± 0.2 lb/in |

Wi-Fi card and shield

Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.



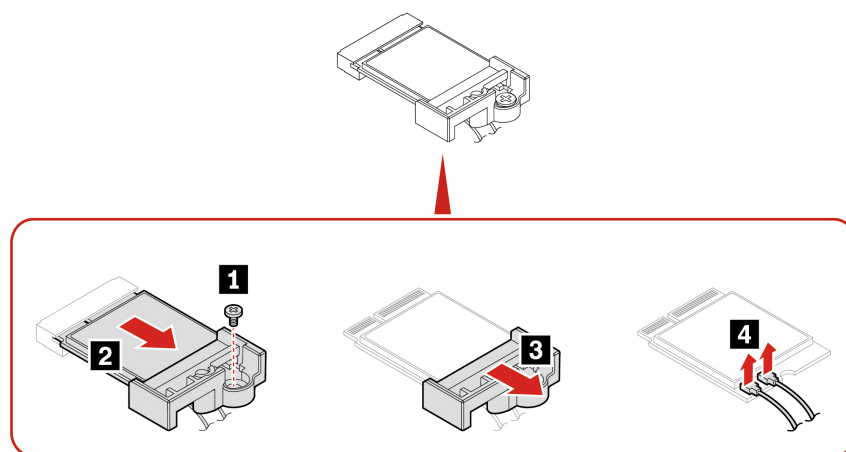
Before you open the device cover, turn off the device and wait several minutes until the device is cool.

For access, do the following:

1. Turn off the device and remove all connected devices and cables.
2. Disconnect the device from ac power and all connected cables.
3. Unlock any locking device that secures the device.

4. Remove the following parts in order, if any:
 - “Power adapter, power cord, and power adapter cage” on page 14
 - “VESA mount brackets and screws” on page 15
 - “Cable management top cover and bottom cover” on page 16
 - “Top cover assembly” on page 18
 - “M.2 solid-state drive and thermal pad” on page 21

Removal steps



| Screw (quantity) | Color | Torque |
|----------------------------|-------|-----------------|
| M2 x 6.5 mm, Zn coated (1) | Black | 1.5 ± 0.2 lb/in |

50-pin signal slave cable

Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.



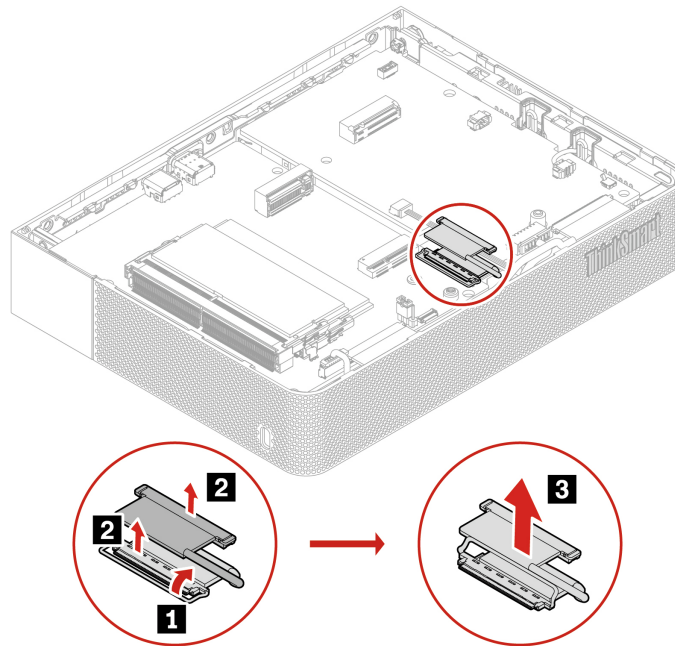
Before you open the device cover, turn off the device and wait several minutes until the device is cool.

For access, do the following:

1. Turn off the device and remove all connected devices and cables.
2. Disconnect the device from ac power and all connected cables.
3. Unlock any locking device that secures the device.
4. Remove the following parts in order, if any:
 - “Power adapter, power cord, and power adapter cage” on page 14
 - “VESA mount brackets and screws” on page 15
 - “Cable management top cover and bottom cover” on page 16
 - “Top cover assembly” on page 18
 - “M.2 solid-state drive and thermal pad” on page 21

- “Wi-Fi card and shield” on page 22

Removal steps



System board and I/O board assembly, heat sink, system fan, and step screw kits

Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.



The heat sink might be very hot. Before you open the device cover, turn off the device and wait several minutes until the device is cool.

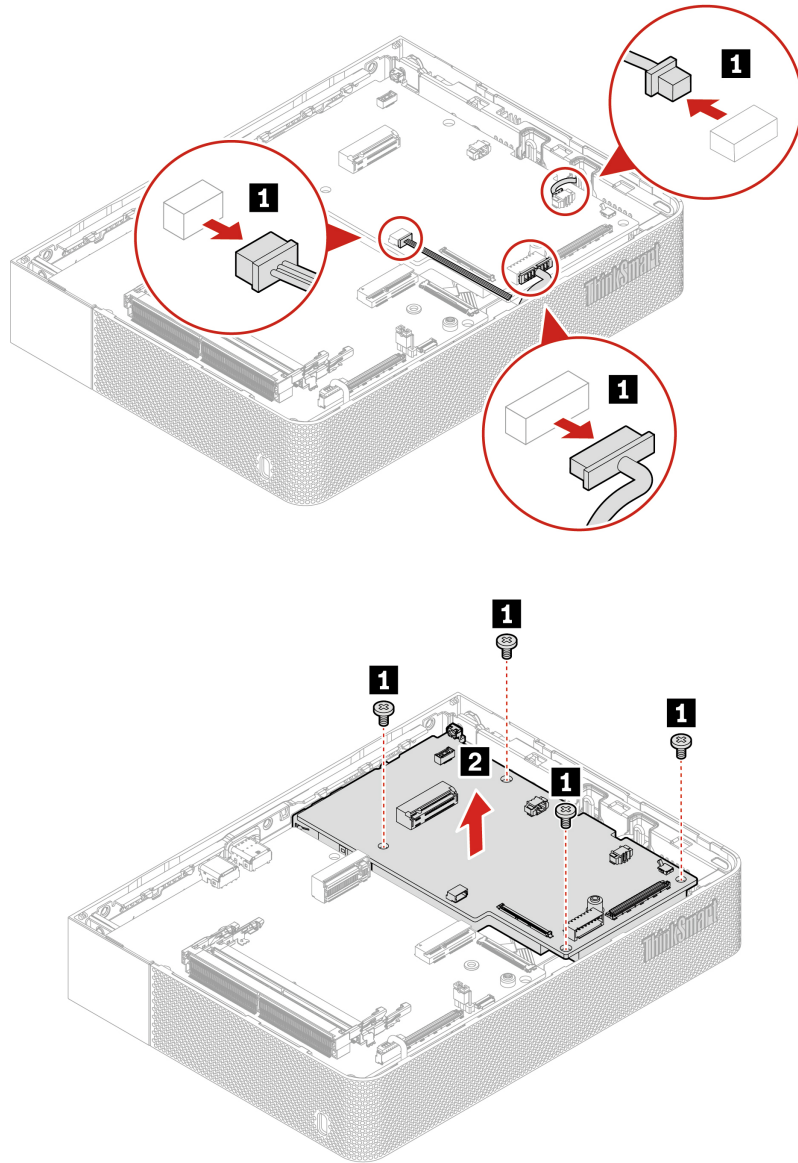
For access, do the following:

1. Turn off the device and remove all connected devices and cables.
2. Disconnect the device from ac power and all connected cables.
3. Unlock any locking device that secures the device.
4. Remove the following parts in order, if any:
 - “Power adapter, power cord, and power adapter cage” on page 14
 - “VESA mount brackets and screws” on page 15
 - “Cable management top cover and bottom cover” on page 16
 - “Top cover assembly” on page 18
 - “Memory modules and thermal pads” on page 18
 - “60-pin signal main cable” on page 20
 - “M.2 solid-state drive and thermal pad” on page 21

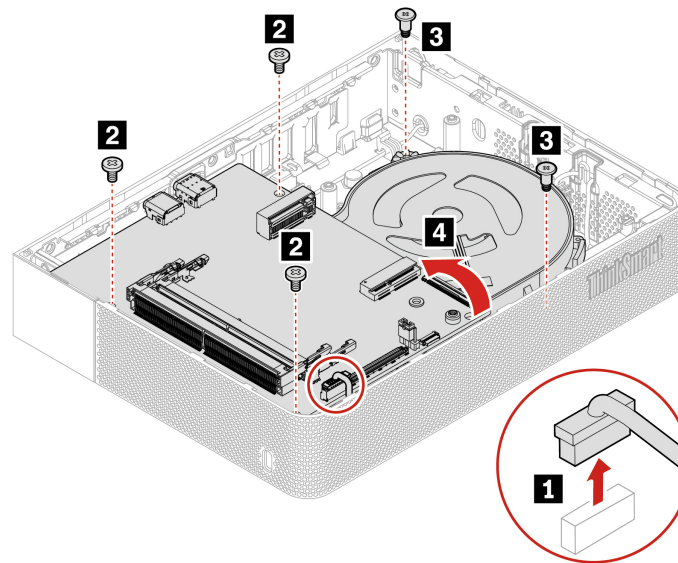
- “Wi-Fi card and shield” on page 22
- “50-pin signal slave cable” on page 23

Removal steps

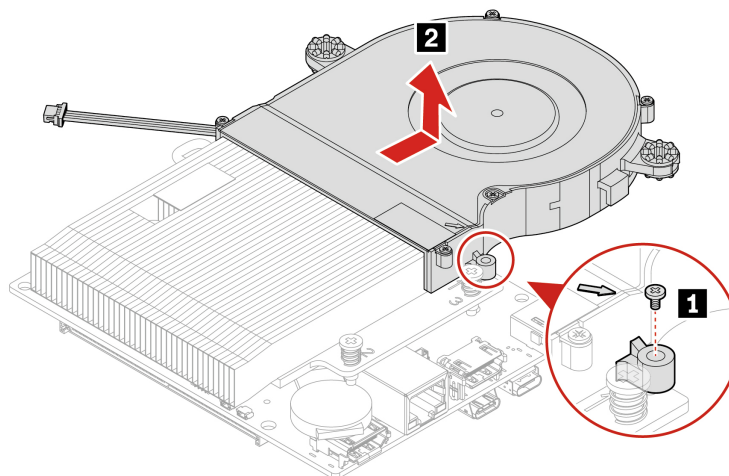
Attention: The system board and I/O board are designed as an assembly FRU and must be replaced together in case either of them is damaged.



| Screw (quantity) | Color | Torque |
|----------------------------|-------|-----------------|
| M2 x 6.5 mm, Zn coated (4) | Black | 1.5 ± 0.2 lb/in |

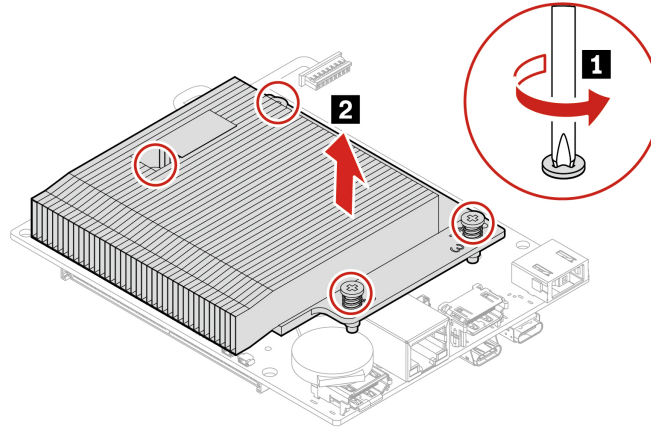


| Step | Screw (quantity) | Color | Torque |
|----------|----------------------------------|-------|-----------------|
| 2 | M2 x 6.5 mm, Zn coated (3) | Black | 1.5 ± 0.2 lb/in |
| 3 | M3 x 3.6 + 6.4 mm, Zn coated (2) | Black | 1.5 ± 0.2 lb/in |



Note: Remove the screw indicated by the arrow in step **1** when removing the system fan.

| Screw (quantity) | Color | Torque |
|----------------------------|-------|-----------------|
| M2 x 6.5 mm, Zn coated (1) | Black | 1.5 ± 0.2 lb/in |



| Screw (quantity) | Color | Torque |
|------------------------------------|--------|-----------------|
| M2.5 x 12.45 mm, Nickel coated (4) | Silver | 1.5 ± 0.2 lb/in |

CMOS battery

Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

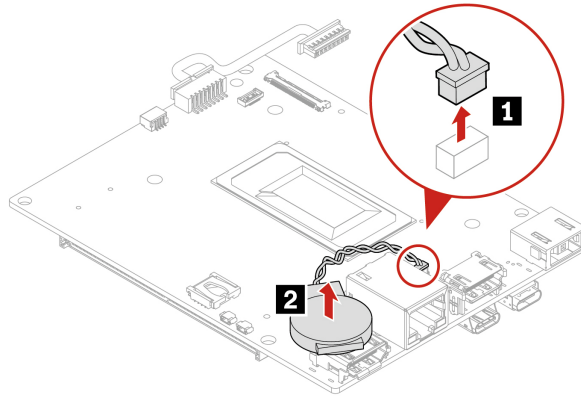


The heat sink might be very hot. Before you open the device cover, turn off the device and wait several minutes until the device is cool.

For access, do the following:

1. Turn off the device and remove all connected devices and cables.
2. Disconnect the device from ac power and all connected cables.
3. Unlock any locking device that secures the device.
4. Remove the following parts in order, if any:
 - “Power adapter, power cord, and power adapter cage” on page 14
 - “VESA mount brackets and screws” on page 15
 - “Cable management top cover and bottom cover” on page 16
 - “Top cover assembly” on page 18
 - “Memory modules and thermal pads” on page 18
 - “60-pin signal main cable” on page 20
 - “M.2 solid-state drive and thermal pad” on page 21
 - “Wi-Fi card and shield” on page 22
 - “50-pin signal slave cable” on page 23
 - “System board and I/O board assembly, heat sink, system fan, and step screw kits” on page 24

Removal steps



I/O power cable

Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

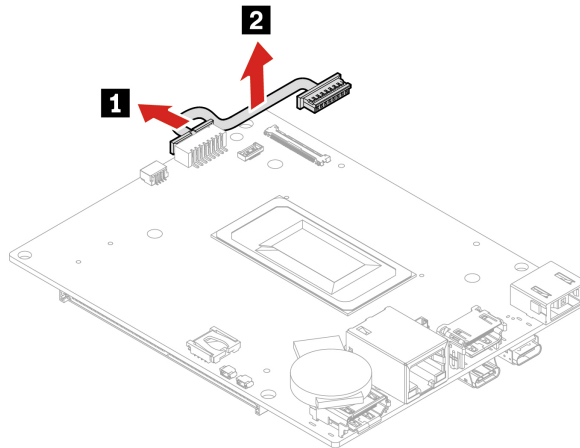


The heat sink might be very hot. Before you open the device cover, turn off the device and wait several minutes until the device is cool.

For access, do the following:

1. Turn off the device and remove all connected devices and cables.
2. Disconnect the device from ac power and all connected cables.
3. Unlock any locking device that secures the device.
4. Remove the following parts in order, if any:
 - “Power adapter, power cord, and power adapter cage” on page 14
 - “VESA mount brackets and screws” on page 15
 - “Cable management top cover and bottom cover” on page 16
 - “Top cover assembly” on page 18
 - “Memory modules and thermal pads” on page 18
 - “60-pin signal main cable” on page 20
 - “M.2 solid-state drive and thermal pad” on page 21
 - “Wi-Fi card and shield” on page 22
 - “50-pin signal slave cable” on page 23
 - “System board and I/O board assembly, heat sink, system fan, and step screw kits” on page 24

Removal steps



USB board and cable

Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

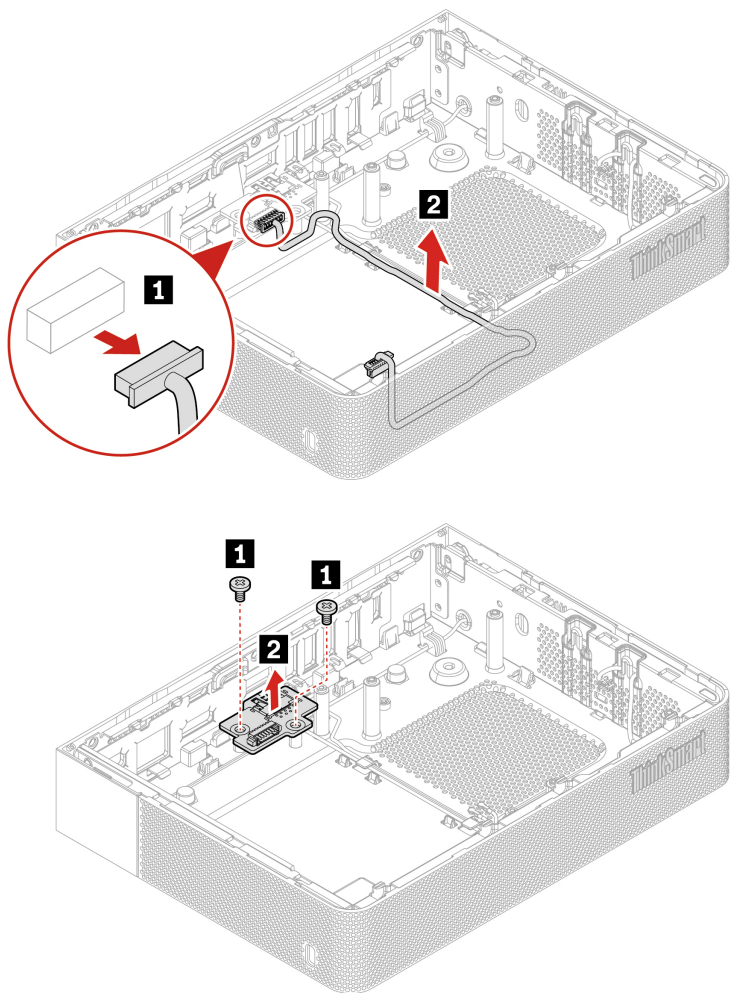


The heat sink might be very hot. Before you open the device cover, turn off the device and wait several minutes until the device is cool.

For access, do the following:

1. Turn off the device and remove all connected devices and cables.
2. Disconnect the device from ac power and all connected cables.
3. Unlock any locking device that secures the device.
4. Remove these parts, if any:
 - “Power adapter, power cord, and power adapter cage” on page 14
 - “VESA mount brackets and screws” on page 15
 - “Cable management top cover and bottom cover” on page 16
 - “Top cover assembly” on page 18
 - “Memory modules and thermal pads” on page 18
 - “60-pin signal main cable” on page 20
 - “M.2 solid-state drive and thermal pad” on page 21
 - “Wi-Fi card and shield” on page 22
 - “50-pin signal slave cable” on page 23
 - “System board and I/O board assembly, heat sink, system fan, and step screw kits” on page 24

Removal steps



| Screw (quantity) | Color | Torque |
|----------------------------|-------|-----------------|
| M2 x 6.5 mm, Zn coated (2) | Black | 1.5 ± 0.2 lb/in |

Chapter 4. Help and support

This chapter provides help and support information for your product.

Self-help resources

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

| Resources | How to access? |
|-----------------------------|--|
| Lenovo Support Web site | https://smartsupport.lenovo.com |
| Product specifications | https://psref.lenovo.com |
| Serial number information | https://smartsupport.lenovo.com/solutions/ht512857 |
| Windows help information | <ul style="list-style-type: none">• Open the Start menu and click Get Help or Tips.• Use Windows Search.• Microsoft support Web site: https://support.microsoft.com |
| ThinkSmart Manager Services | https://support.lenovo.com/solutions/tsm |
| Microsoft Teams Rooms | https://learn.microsoft.com/MicrosoftTeams/rooms |
| Zoom Help Center | https://support.zoom.us/hc/categories/200108436 |
| Lenovo Community | https://forums.lenovo.com |

Additional services

Thank you, Lenovo customer, for your purchase of a ThinkSmart device.

During and after the warranty period, you can purchase additional services from Lenovo at: <https://pcsupport.lenovo.com/warrantyupgrade>. Service availability and service name might vary by country or region.

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

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/supportphonenumberlist>

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 (LLW) that apply to your Lenovo hardware product, see the LLW documentation at:

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

The LLW is also preinstalled on your device. To access the LLW, go to the following directory:

C:\Windows\System32\oobe\info\default

Appendix A. Notices and trademarks

Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area. Any reference to a Lenovo product, program, or service is not intended to state or imply that only that Lenovo product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any Lenovo intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any other product, program, or service.

Lenovo may have patents or pending patent programs covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

*Lenovo (United States), Inc.
8001 Development Drive
Morrisville, NC 27560
U.S.A.
Attention: Lenovo Director of Licensing*

LENOVO PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

Changes are made periodically to the information herein; these changes will be incorporated in new editions of the publication. To provide better service, Lenovo reserves the right to improve and/or modify the products and software programs described in the manuals included with your device, and the content of the manual, at any time without additional notice.

The software interface and function and hardware configuration described in the manuals included with your device might not match exactly the actual configuration of the device that you purchase. For the configuration of the product, refer to the related contract (if any) or product packing list, or consult the distributor for the product sales. Lenovo may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

The products described in this document are not intended for use in implantation or other life support applications where malfunction may result in injury or death to persons. The information contained in this document does not affect or change Lenovo product specifications or warranties. Nothing in this document shall operate as an express or implied license or indemnity under the intellectual property rights of Lenovo or third parties. All information contained in this document was obtained in specific environments and is presented as an illustration. The result obtained in other operating environments may vary.

Lenovo may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any references in this publication to non-Lenovo Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this Lenovo product, and use of those Web sites is at your own risk.

Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

This document is copyrighted by Lenovo and is not covered by any open source license. Lenovo may update this document at any time without notice.

For the latest information or any questions or comments, contact or visit the Lenovo Web site:

<https://smartsupport.lenovo.com>

Trademarks

Lenovo, Lenovo logo, ThinkSmart, and ThinkSmart logo are trademarks of Lenovo. Microsoft and Windows are trademarks of the Microsoft group of companies. VESA is a trademark of the Video Electronics Standards Association. The terms HDMI and HDMI High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing LLC in the United States and other countries. USB-C is a registered trademark of USB Implementers Forum. Wi-Fi is a registered trademark of Wi-Fi Alliance. All other trademarks are the property of their respective owners.

Lenovo