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SERVICE GUIDE

Gaming

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Business & Productivity



MSI

MS-15F4
SERVICE GUIDE
LAPTOP

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Revision History

- ▶ Version: 1.0
- ▶ Date: 12, 2024

How to Use This Service Guide

This Service Guide provides detailed instructions and illustrations for installing key parts of the laptop. Additionally, this Service Guide provides an in-depth explanation on assembling and disassembling the laptop. Each topic may be related with each other; hence you are highly recommended to read this guide from cover to cover first. After that, you may go directly to any specific topic that most meets your immediate needs.

Safety Precautions

The following precautions must be observed in handling the laptop to prevent safety issues that may lead to person injury or death, or may result in damage and may compromise the laptop's functionality:

- Place the laptop on a flat, level and stable surface when performing any service.
- Do not place the laptop in environments subject to mist, smoke, vibration, excessive dust, salty or greasy air, or other corrosive gases and fumes.
- Do not drop or jolt the laptop
- Do not bump or knock the LCD screen as it is fragile and could break.
- Do not use another power adapter other than the one enclosed with the laptop.
- Disconnect the power adapter and the battery pack from the laptop before performing any installation procedures on the laptop.
- Do not perform any maintenance with wet hands.
- Prevent foreign substances, such as water, other liquids or chemicals, from entering the laptop while performing installation procedures on the laptop.
- It is suggested to use a grounded wrist strap while handling laptop components which are sensitive to electro static discharge (ESD). When touching a sensitive component or assembly, ensure that it is properly grounded.
- Place components (CPU, Memory, HDD, mini-PCI Card, etc) on a grounded antistatic pad or on the bed that came with the components whenever the components are separated from the Laptop.
- Always handle electrostatic sensitive components, parts, and assemblies only at static-free work areas.
- If there are any difficulties installing hardware devices, please contact MSI Service Center for further information.

Other Notice

- The laptop, the reference figures, and recommended procedures selected and shown herein may be varied depending on the actual model users purchased.
- The peripheral devices and tools contained herein may be varied depending on the actual configuration.
- Third-party trademarks and names are the properties of their respective owners
- The software and hardware information contained in this guide are for reference only and may vary in accordance with actual system configuration.
- No warranty as to accuracy or completeness is expressed or implied. MSI reserves the right to make changes to this document without prior notice.

Conditional Warranty Service

MSI provides a conditional warranty service for selected models. Contact [MSI Member Service](#) to obtain further information.

Upgrade and Service

Available hardware features may only be offered as part of an upgrade, repair, or replacement service offered by MSI or an authorized service provider.

MSI offers customers all EPEAT-registered products, replacement parts, product repair and services for 3 years from the date of sale.

Damages caused by servicing of products not authorized by MSI or the use of modified or non-MSI authorized parts or components are not covered by MSI Limited Warranty Agreement.

Visit [MSI Service Location](#) to obtain these services offered by MSI.

Go to [MSI Web Ticket](#) to receive further assistance if it is needed.

Publicly Available Service Information

Service Information	Section
Disassembly instructions including identifying the required tools.	Product Components and Accessories Necessary Tools
Exploded diagram of parts.	Product Components and Accessories
List of spare parts including manufacturer-approved spare parts and how to obtain them.	Product Upgradeability & Repairability
Maintenance procedures or guidance on where to obtain the procedures.	System Diagnosis
Troubleshooting instructions, software diagnostic tools, troubleshooting videos or other troubleshooting guidance.	Troubleshooting
Instructions on how to obtain software updates (not applicable to display products).	Support
Instructions on how the user can remove personal data. If the instructions require destruction of the storage, instructions to replace the storage shall be provided (not applicable to display products).	Data Sanitization
It is acceptable for service instructions to exclude information that, as determined by the manufacturer:	
a) May expose the user to risk of injury, or	N/A
b) Breaches intellectual property rights, or	N/A
c) Compromises user privacy or security, or	N/A
d) Involves the disassembly of a battery pack or power supply	N/A
If claiming any of the four exclusions above the manufacturer shall demonstrate how the product is restored to normal operating condition after being repaired. Repair may include replacement of the component(s) associated with the exclusion.	N/A

Data Sanitization

MSI will not assume any responsibility or confidentiality obligation for the security of any data stored on the equipment submitted for recycling. Our customer is advised to back up and remove all data from the computers.

In order to wipe out the data from the computers, we recommend using the recovery procedure to clean up the data.

The recovery procedure please refer to [Data Sanitization](#).

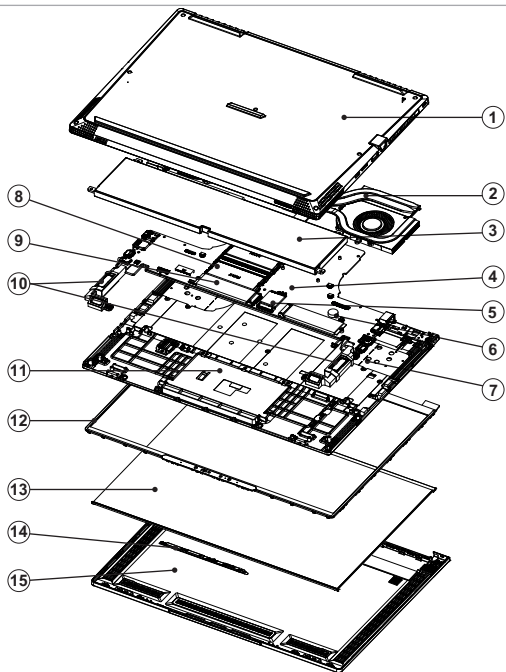
Disassembly and Assembly

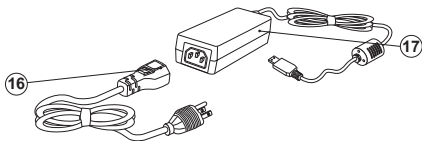


MSI provides the below list of components for the system configuration purchased and within 2 years after discontinuation of the product to increase the operational life of that product.

Further services can be obtained by contacting [MSI Online Customer Service](#).

Product Components and Accessories





- | | |
|--------------------------------|---|
| 1. Back Cover | 10. Speakers |
| 2. Thermal Module | 11. Touchpad Module |
| 3. Battery Pack | 12. LCD Bezel |
| 4. Mainboard | 13. LCD Panel |
| 5. WLAN Card | 14. Camera Module |
| 6. Coin Battery | 15. Front Cover |
| 7. Keyboard Module (Main Base) | 16. Power Cord |
| 8. Memory Card | 17. External Power Adapter Power Supply |
| 9. SSD Card | |
-

Product Upgradeability & Reparability

Hardware features for upgradeable, repairable or replaceable using only commonly available tools and listing of replaceable spare parts by-products can be obtained by contacting [MSI Online Customer Service](#).

For replacement, repair, or upgrade methods, please refer to the hyperlinks in the table below.

Hardware feature items	Upgradeable	Repairable	Replaceable	Soldering
The main processor(s) or system on a chip (SOC)	No	No	No	Yes
The main memory capacity of the system	No	No	Yes	Yes
The mass storage capacity of the system	Yes	No	Yes	No
Wireless networking capability	No	No	Yes	Yes
Graphics capability(integrated or discrete)	No	No	No	Yes
Display panel or display assembly	No	No	Yes	No
Integrated mechanical keyboards	No	No	Yes	No
All batteries	No	No	No	No
All external and internal power supplies	No	No	Yes	No
All fan assemblies	No	No	Yes	No
AND At least two of the following (or one, if all remaining are absent from product):	Upgradeable	Repairable	Replaceable	Soldering
Speakers	No	No	Yes	No
Camera	No	No	Yes	No
Touchpad	No	No	Yes	No
I/O connectors and external power connection	No	No	No	Yes
Readers (eg. magnetic stripe, Dallas key, fingerprint, Smart card)	No	No	No	Yes



- The laptop, the reference figures, and the recommended procedures selected and shown herein may be varied depending on the actual model users purchased.
 - The peripheral devices or tools contained herein may be varied depending on the actual configuration.
-

Necessary Tools

The following tools may be needed while performing the disassembly and assembly procedures on the laptop.

- ▶ Cross type screwdriver
- ▶ Parallel screwdriver
- ▶ Tweezers
- ▶ Pry tool
- ▶ Diagonal pliers
- ▶ Heat gun (optional)
- ▶ Anti-static wrist strap (optional)
- ▶ Anti-static mat with grounding wire (optional)

Screw List

Please refer to the screw list below while proceeding the disassembly and assembly of the laptop.

Note: this screw list provided is for reference only, and may be varied from models to models. It is always highly recommended to contact the authorized service center for further assistance.

Components	Type	Q'ty
Back Cover	M2.5X9	5
	M2.5X6.5	2
Battery Pack	M2X4	4
Thermal Module	M2X4	12
SSD Card	M2X3	2
WLAN Card	M2X3	1
Mainboard	M2X3	6
Touchpad Module	M2X2	2
Keyboard Module (Main Base)	M1.2X1.5	62



- Disconnect power from the laptop by unplugging the power cord from the AC outlet.
 - If a power cord with 3-prong plug came with the package, do not remove the grounding pin of the power cord, since it is an important safety feature.
 - Always use the power adapter and power cord approved by MSI, or a compatible one purchased from MSI.
 - Place the power cord in a way that people are unlikely to step on it. Do not place anything on top of the power cord.
-

Power Cord Disconnection

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1. Power off the laptop.
 2. Unplug the power cord from both the laptop and the AC outlet.
-



Disassembly and Assembly



- Place the laptop on a flat, level and stable surface.
 - Do not place the laptop in environments subject to mist, smoke, vibration, excessive dust, salty or greasy air, or other corrosive gases and fumes.
 - Do not perform any maintenance with wet hands.
 - Use a grounded wrist strap before handling laptop components which are sensitive to ESD.
 - Always disconnect the AC power before proceeding the disassembly procedures.
 - Before recycling the separated plastic parts, please use diagonal pliers to remove all the screw bosses with copper sticks, if any.
-

Back Cover

[Go Top](#)

Follow the instructions below to disassemble or assemble the back cover of the laptop.



Important: It is a must to find the battery reset hole on the bottom side of the laptop, and then use a straightened paperclip and insert it into this hole to cut off the battery power supply.



Back Cover Disassembly

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1. Remove all the screws that secure the back cover with a cross type screwdriver.
 2. Apply force from the upper left corner of the back cover to disengage the left upper and lower hooks and then disengage the right upper and lower hooks. Remove the back cover.
-



Back Cover Assembly

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1. To assemble the back cover, align the upper left and right corners of the back cover, and attach the back cover in position properly. Place the lower left and right corners of the back cover back to its position.
 2. Reattach all the screws and make sure they are fastened properly.
-



Battery

Battery Recycling Information

MSI offers battery recycling information to ensure that your battery can be recycled properly as you perform replacement or your battery is at the end of its life. Please refer to [MSI Electronic and Electrical Product Waste Management](#) to get further information.

Battery Replacement Information

For main product rechargeable batteries, MSI provides information on how to obtain and replace the battery of the product.

Further services can be obtained by contacting [MSI Service Location](#).

Swollen Battery Management

The lithium-ion polymer battery equipped to provide the power for the laptop may have the potential for swelling of the battery. The lithium-ion batteries can swell for various reasons such as age, number of charge cycles, or exposure to high heat. The swollen battery may impact the performance of the laptop and should not be used. Please dispose the swollen battery properly, and contact the authorized MSI service center or local dealer for battery replacement.

Safety Notice

- Replacement of a battery pack with an incorrect type that can defeat a safeguard.
- Always discharge the battery before removing it from the laptop.
- If a swollen battery gets stuck in the laptop, do not try to take it out by puncturing, bending, or crushing the battery with force.
- Do not crush, drop, or bend the battery. Applying pressure to the battery is also not allowed .
- Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery, that can result in an explosion.
- Leaving a battery in an extremely high temperature surrounding environment that can result in an explosion or the leakage of flammable liquid or gas.
- A battery subjected to extremely low air pressure that may result in an explosion or the leakage of flammable liquid or gas.
- Always keep the strong magnetic or electrical objects away from the battery and laptop.
- Disconnect the power adapter and the battery pack from the laptop before performing any installation procedures on the laptop.

Disassembly and Assembly

- It is suggested to use a grounded wrist strap while handling laptop components which are sensitive to ESD. When touching a sensitive component or assembly, ensure that it is properly grounded.
- Always follow the instructions to disassemble or assemble the battery, or it may cause damage to the laptop, disaster of fire, or electric shock.

Battery Pack Disassembly

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View the instructions below to disassemble the battery pack of the laptop.

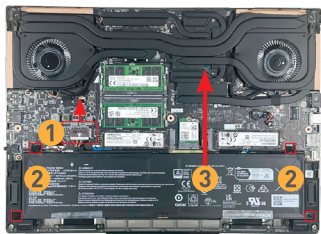


For more information about the replacement of battery pack, please refer to [Upgrade and Service](#) to get further information.



Always disconnect the battery cable before proceeding the disassembly procedures.

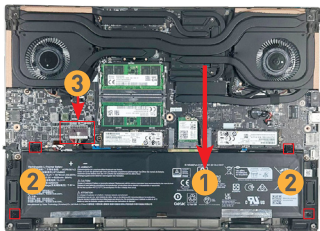
1. Locate the battery pack and find the battery cable connector. **1** Use your fingers to lift the buckle up and pull it out of the socket vertically.
 2. Remove all the screws that secure the battery pack with a cross type screwdriver. **2**
 3. Remove the battery pack. **3**
-



Battery Pack Assembly

[Go Top](#)

1. Place the battery pack into the battery tray properly. **1**
 2. Reattach all the screws and make sure they are fastened properly. **2**
 3. Connect the battery cable connector. **3** Firmly insert the battery cable connector into the slot, and then press down the connector.
-



Disassembly and Assembly

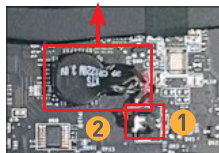
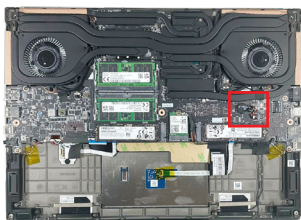


WARNING: Do not ingest battery. If the coin / button cell battery is swallowed, it can cause severe internal burns and can lead to death. Keep new and used batteries away from children.

Coin Battery Disassembly

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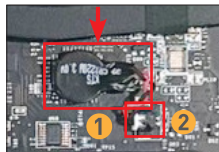
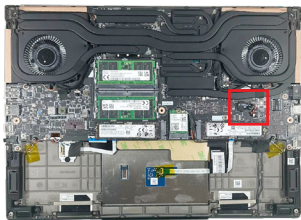
1. Disconnect the coin battery cable. ①
 2. Remove the coin battery. ②
-



Coin Battery Assembly

[Go Top](#)

1. Place the coin battery back to the correct position. ①
 2. Connect the coin battery cable. ②
-

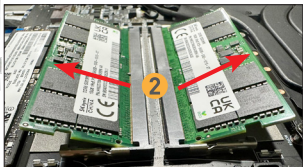
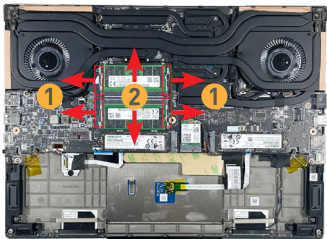


Memory Card

Memory Card Disassembly

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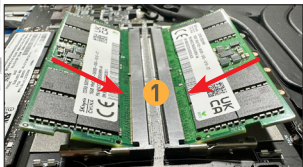
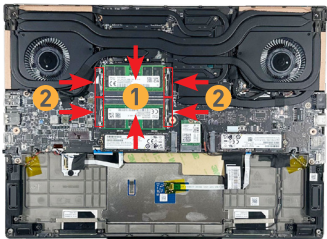
1. Lift up both hooks of the memory card. **1**
2. Remove the memory card. **2**



Memory Card Assembly

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1. To assemble the memory card, align and insert the memory card into the slot with 30° angle. **1**
2. Press down the memory card.
3. Reattach both hooks to secure the memory card. **2**

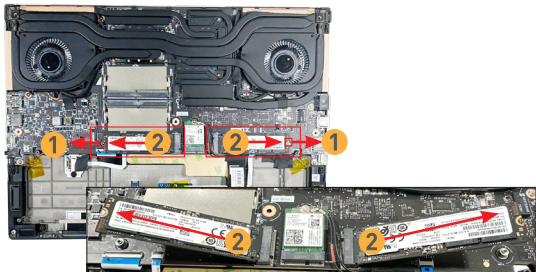


SSD Card

SSD Card Disassembly

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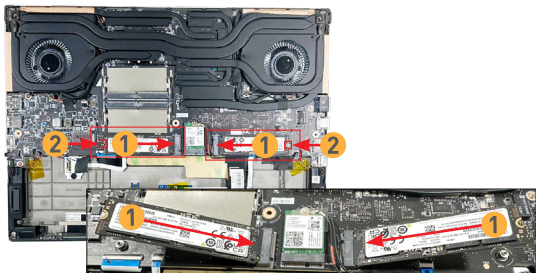
1. Locate the SSD card.
2. Loosen the screw **1** with a cross type screwdriver, and remove the SSD card. **2**



SSD Card Assembly

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1. To assemble the SSD card, align and insert the SSD card into the slot with 30° angle. **1**
2. Reattach the screw to secure the SSD card. **2**

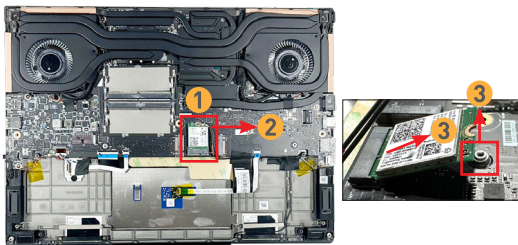


WLAN Card

WLAN Card Disassembly

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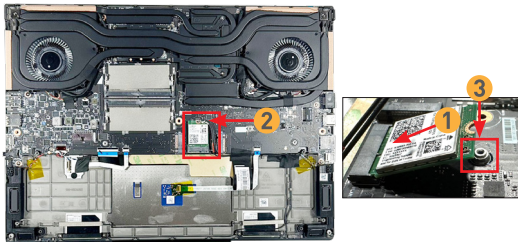
1. Locate the WLAN card. ❶
2. Disconnect the MAIN (black) and AUX (red) antenna cable joint. ❷
3. Loosen the screw with a cross type screwdriver and remove the WLAN card. ❸



WLAN Card Assembly

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1. To assemble the WLAN card, align and insert the WLAN card into the slot with 30° angle. ❶
2. Connect the MAIN (black) and AUX (red) antenna cable joint. ❷
3. Reattach the screw to secure the WLAN card. ❸

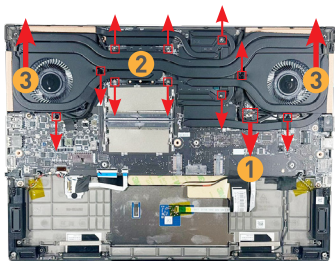


Thermal Module

Thermal Module Disassembly

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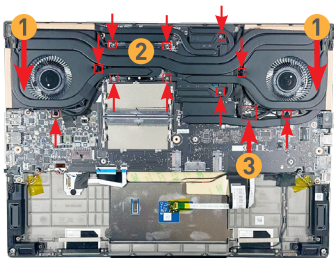
1. Disconnect the fan cable connector. ❶
 2. Loosen all the screws that secure the thermal module with a cross type screwdriver. ❷
 3. Remove the thermal module vertically with care. ❸
-



Thermal Module Assembly

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1. To assemble the thermal module, align and install the thermal module with the correct orientation. ①
 2. Secure the thermal module with screws. ②
 3. Connect the fan cable connector. ③
-

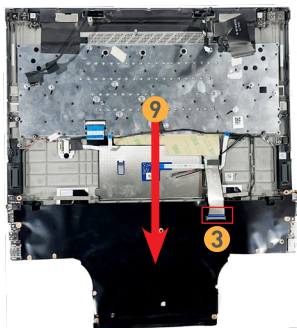
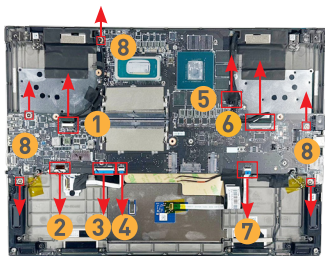


Mainboard

Mainboard Disassembly

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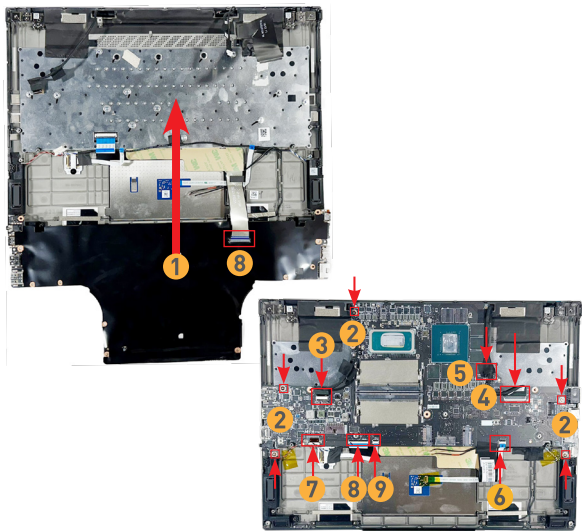
1. Disconnect the camera cable connector **1**, speaker cable connector **2**, keyboard cable connector **3**, fingerprint cable connector **4**, touchpad cable connector **5**, keyboard LED cable connector **6** and LCD cable connector **7**.
2. Loosen the screws that secure the mainboard with a cross type screwdriver **8**.
3. Disconnect keyboard cable connector **3** to the back of mainboard.
4. Remove the mainboard with care **9**.



Mainboard Assembly

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1. To assemble the mainboard, place the mainboard **1** back to its position with correct orientation.
 2. Secure the mainboard with all the screws **2**.
 3. Connect the camera cable connector **3**, LCD cable connector **4**, keyboard LED cable connector **5**, touchpad cable connector **6**, speaker cable connector **7**, keyboard cable connector **8** and fingerprint cable connector **9**.
-

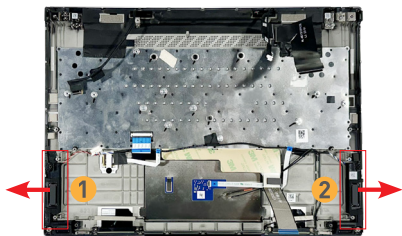


Speakers

Speakers Disassembly

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1. Locate the left **1** and right **2** speakers.
 2. Pull out the speakers vertically with care. Gently pull out the speaker cable from the cable management ditch.
-



Speakers Assembly

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1. To assemble the speakers, insert the left **1** and right **2** speakers vertically with care. Arrange the speaker cable into the cable management ditch.
-

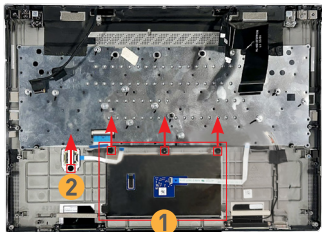


Touchpad Module

Touchpad Module Disassembly

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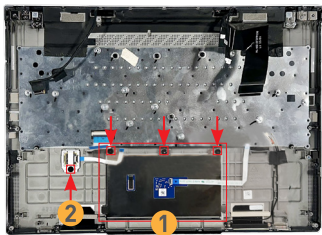
1. Loosen the screws that secure the touchpad module **1** and fingerprint sensor **2** with a cross type screwdriver, and then remove the touchpad module.



Touchpad Module Assembly

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1. Place the touchpad module back to its position with the correct orientation and then reattach the screws to secure the touchpad module **1** and fingerprint sensor **2**.

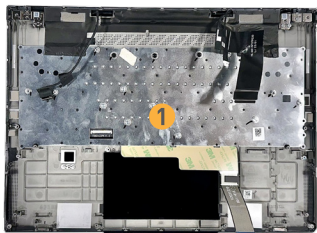


Keyboard Module (Main Base)

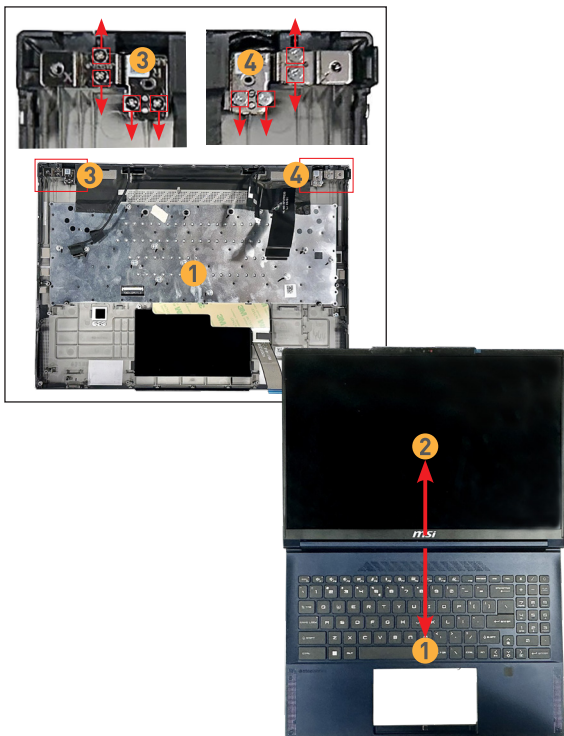
Keyboard Module (Main Base) Disassembly

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1. Turn over the laptop to check the keyboard module (main base) **1** and the LCD display module. **2**
-



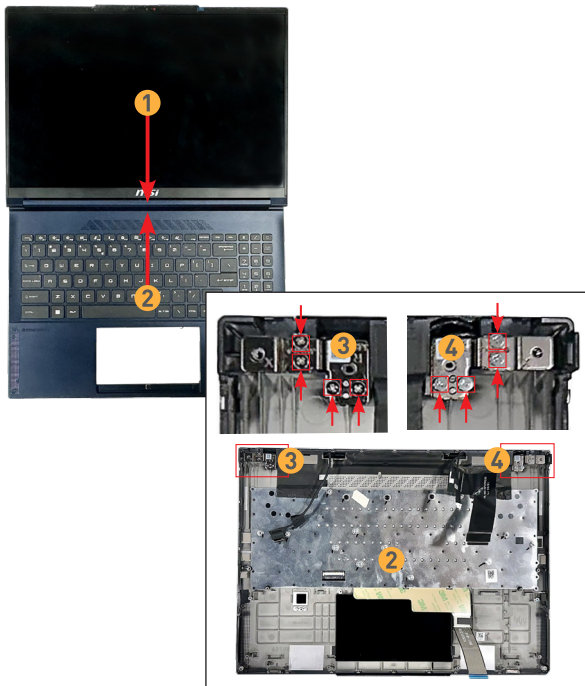
-
- Loosen screws that secure the left **3** and right **4** joint of each side with a cross type screwdriver.
 - Separate the LCD display module **2** and the keyboard module (main base) **1**.
-



Keyboard Module (Main Base) Assembly

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1. Place the LCD display module **1** and the keyboard module (main base) **2** back to its position with correct orientation.
 2. Reattach the screws to secure the left **3** and right **4** joints of each side with a cross type screwdriver.
-

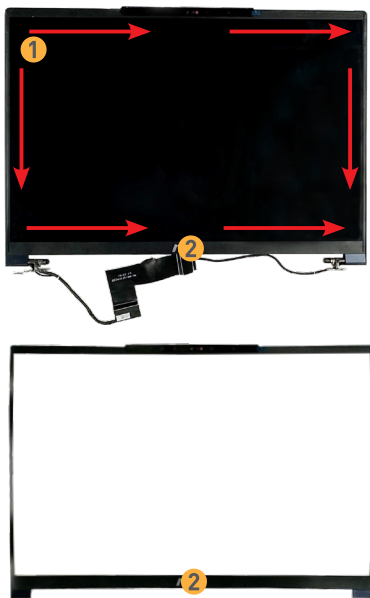


LCD Display Module

LCD Bezel Disassembly

[Go Top](#)

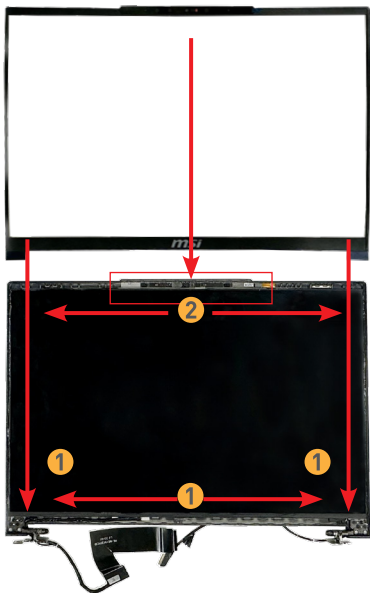
1. Follow the direction marks **1** shown below to separate the LCD bezel **2** from the LCD display with a pry tool.
 2. Remove the LCD bezel **2** from the LCD display module with care.
-



LCD Bezel Assembly

[Go Top](#)

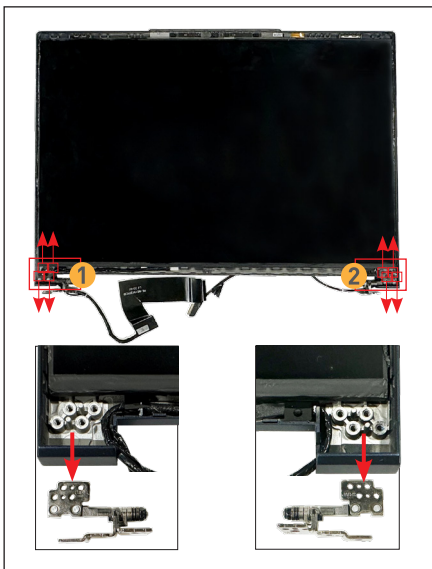
1. Follow the direction marks **1** to assemble the LCD bezel to the LCD display module.
 2. Align the LCD bezel to the camera module **2**, and use fingers to fasten the LCD bezel to the LCD display module from the middle to both sides.
-



LCD Panel Disassembly

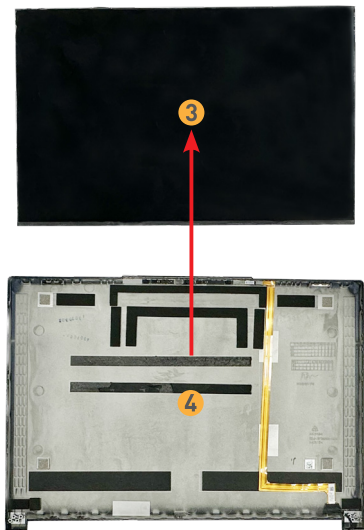
[Go Top](#)

1. Use a cross type screwdriver to loosen the screws that secure the left **1** and right **2** hinge located on the lower left **1** and right **2** bottom corners of the LCD display module.
-



Disassembly and Assembly

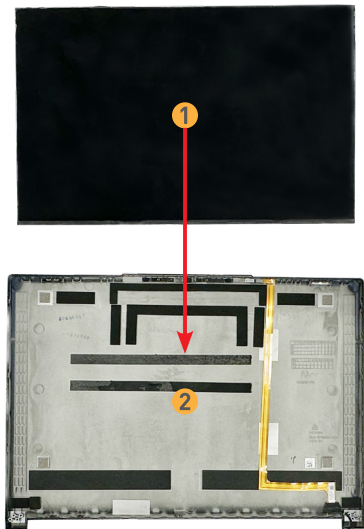
2. Slightly lift up and separate the LCD panel **3** from the front cover **4** of the laptop.
-



LCD Panel Assembly

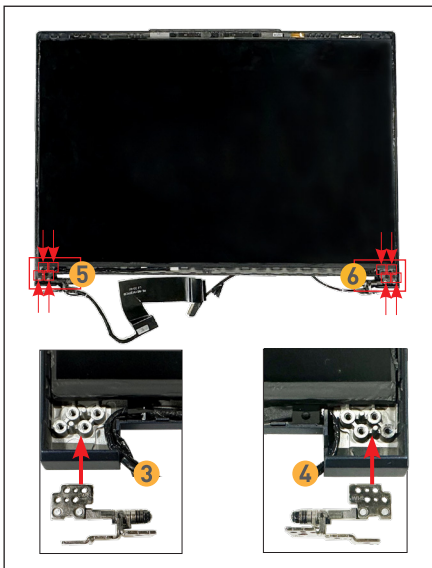
[Go Top](#)

1. Align the LCD panel **1** and the front cover **2** of the laptop with correct orientation.
 2. Install the LCD panel back to its position.
-



Disassembly and Assembly

- Align the left **3** and right **4** hinges to LCD Display with correct orientation.
 - Use a cross type screwdriver to fasten all screws to secure the left **5** and right **6** hinges.
-

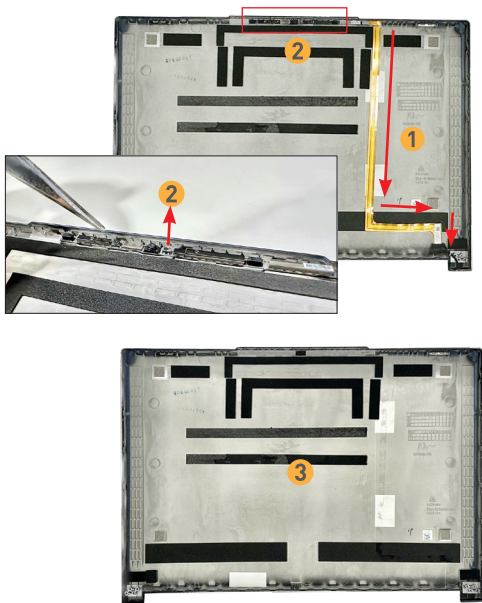


Camera Module

Camera Module Disassembly

[Go Top](#)

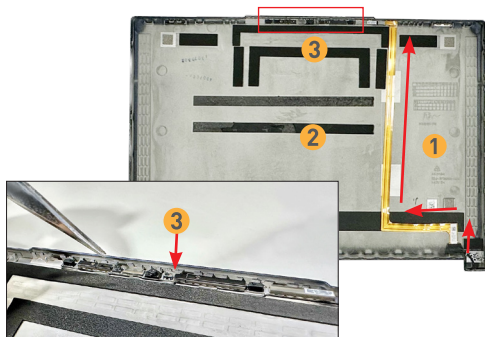
1. Follow the direction marks shown below to tear off the camera cable. **1**
 2. Use a tweezers to gently separate and remove the camera module **2** from the front cover **3** with care.
-



Camera Module Assembly

[Go Top](#)

1. Follow the direction marks **1** to paste the camera cable onto the front cover **2** of the laptop.
 2. Install the camera module **3** with correct orientation and with care.
-



Front Cover

This is the front cover's outer side **1** and its inner side. **2**

Front Cover Disassembly

Refer to the previous instructions to remove LCD display module and camera module.

Front Cover Assembly

Refer to the previous instructions to install camera module and LCD display module.

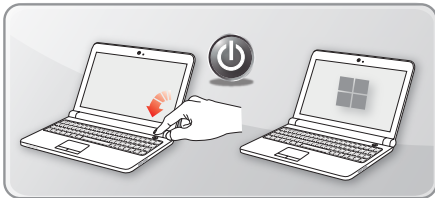
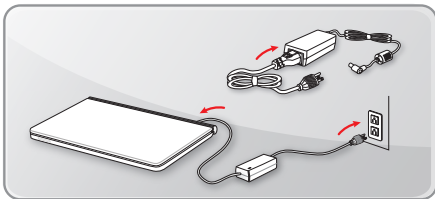


AC Power Connection and Power on the Laptop



- Plug the power cord into an AC outlet that is easily accessible at all times.
- If a power cord with 3-prong plug came with the package, always plug the power cord into a grounded (earthed) AC outlet. Do not remove the grounding pin of the power cord, since it is an important safety feature.
- Always use the power adapter and power cord approved by MSI, or a compatible one purchased from MSI.
- Place the power cord in a way that people are unlikely to step on it. Do not place anything on top of the power cord.

1. Connect the power cord to both the laptop and the AC outlet.
2. Power on the laptop.



Troubleshooting

You may refer to the troubleshooting articles listed below for quick and easy self-examination when running into problems. It is always suggested to contact the authorized MSI service center for advanced assistance, if needed.

Unable to Power On

If pressing the power button results in the notebook failing to power on, displaying a black screen, or being unable to boot into the system, please follow the troubleshooting steps below. Before starting, ensure that your notebook is prepared as follows:

1. Use the MSI original adapter provided to charge the notebook for at least thirty minutes.
2. Please refer to [Notebook] How to update BIOS? to obtain the latest version of BIOS firmware updates from the official MSI product page.
3. Remove all external devices, including but not limited to USB drives, external microphones, speakers, headphones, mice, external solid-state drives, etc.
4. If your notebook has recently undergone hardware changes (e.g., memory, solid-state drive, etc.) prior to the issue, please restore the hardware configuration to its factory settings.

After confirming the above preparations, follow the instructions below based on the actual condition of your notebook to troubleshoot the problem.

Touchpad Not Working

If your MSI laptop's touchpad is not working, please follow these troubleshooting steps.

1. Press "FN+F3" to enable the touchpad. For some models, the activation combination may be "FN+F4" (e.g., Summit, Prestige series).
2. If the touchpad cannot be toggled using the shortcut keys, open the system settings to enable or disable the touchpad.
3. After enabling the touchpad function, also ensure that "Leave touchpad on when a mouse is connected" is set off. If this option is enabled, the touchpad will be disabled when a mouse is detected.

Built-in Speakers Have No Sound Output

When your notebook's built-in speakers have no sound output, please follow the steps below for troubleshooting.

1. Check the Sound settings within System Settings.
2. Download the audio card driver from the MSI official website, then perform the driver update.
3. Reset the EC of the device and then confirm whether the problem is resolved.
4. Update your BIOS to the latest version.
5. Run Windows Update

Unable to Connect to Wi-Fi

When the wireless network function on your notebook cannot be used, it is recommended to first check if the network and related devices are functioning properly, and then proceed with driver updates and troubleshooting for the notebook.

1. Confirm network devices and status
Please use a smartphone or another computer to confirm if the router and wireless access point are functioning properly. If other devices cannot connect to the network either, it is suggested to contact your internet service provider and check the hardware or settings of the router and wireless access point.
2. Restore the BIOS settings
Please reset the BIOS to default values. If the problem persists, please continue with the following troubleshooting steps.
3. Visit the MSI official website to download necessary drivers.
4. Reset the network
5. Update BIOS and run Windows Update

Battery Charging Issues

Check the wall socket, power cord, and power connector to ensure they are properly connected.

Always ensure that the charger's maximum charging power output meets the minimum requirements with the laptop's original charger, otherwise the charger may not be able to charge your laptop.

System displays "Connected to Power, Not Charging"

Some MSI laptops are equipped with "Battery Protection Technology" to prevent frequent charging and discharging, which can reduce battery life. This mechanism is a normal behavior when charging the battery.

System stops charging at a specific battery level

If your MSI laptop stops charging at 60% or 80%, please check the "Battery Health Option" or "Battery Master" within MSI software application.

Open the MSI software and check the current battery settings. If the battery is in "Balanced Mode" or "Best for Battery Mode," switch it to "Best for Mobility Mode."

Low battery health and maximum capacity reduced

If your battery health is low and the maximum capacity has reduced, please perform battery calibration 1-2 times, and check if the issue is resolved.

MSI recommends performing battery calibration every 3 months for optimal battery life.

Recycling Procedures

Front Cover

[Go Top](#)

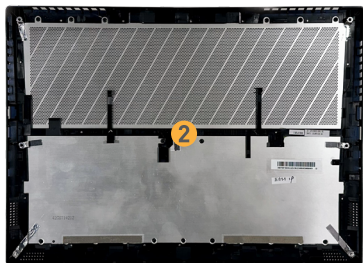
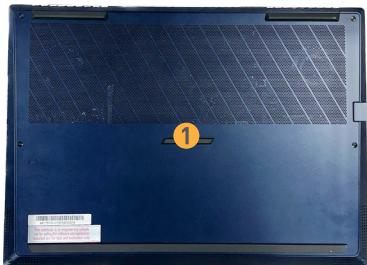
1. This is the front cover's outer side **1** and its inner side. **2**
 2. Please recycle the front cover to qualified recyclers.
-



Back Cover

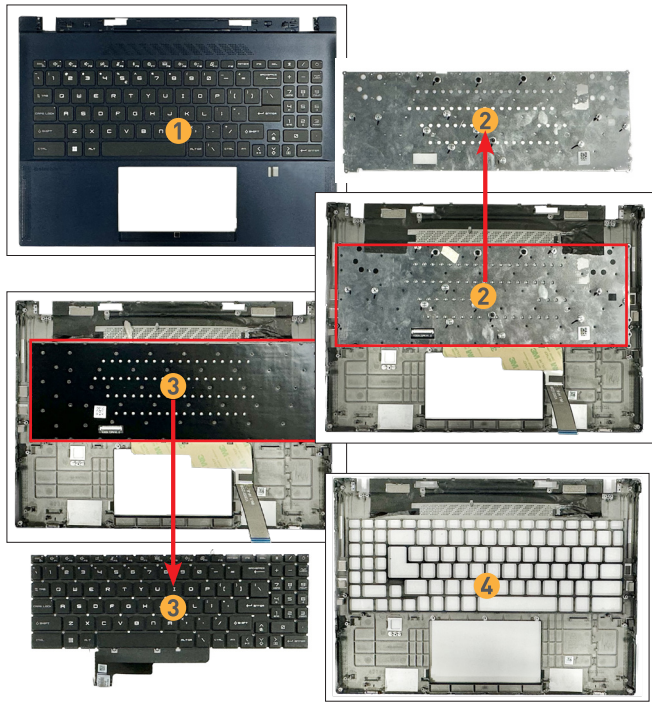
[Go Top](#)

1. This is the back cover's outer side **1** and its inner side. **2**
 2. Please recycle the plastic back cover to qualified recyclers.
-



Keyboard Module (Main Base)

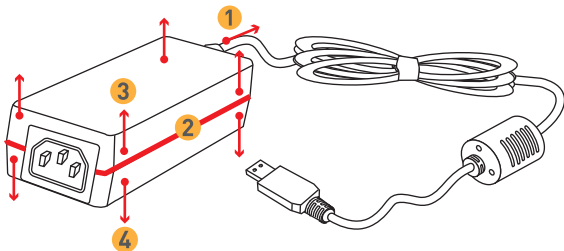
1. Turn over the keyboard module (main base). ❶
2. Remove all the screws on keyboard shielding and remove keyboard shielding. ❷
3. Remove the keyboard. ❸
4. Please recycle the upper case ❹ to qualified recyclers.



External Power Adapter Power Supply

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1. Use diagonal pliers to cut the external power supply DC cable **1**.
 2. Use heat gun to heat the between **2** of upper **3** and lower **4** cases of the power adapter, and then use parallel screwdriver to separate the cases.
 3. The removed upper **3** and lower **4** cases of the power adapter can be recycled by qualified recyclers .
-



Product End-of-Life Instructions



MSI Environmental Information

Information on MSI's Environmental initiatives, policies, programs and goals can be found at [MSI ESH Policy](#).

Purpose

This information is to provide the guidance to recyclers on the presence of materials and components at the product level, as required by the EU WEEE and amending Directive.

The Product Identify Materials Information

The following substances, preparations, or components should be disposed of or recovered separately from other WEEE in compliance with Article 4 of EU Council Directive 75/442/EEC.

Identify materials for materials and components of the waste electrical and electronic equipment list.

*1: Please refer to the figures shown in [Product Components and Accessories](#) by hovering the mouse cursor over the item number.

Materials	Item*1	Location
Polychlorinated biphenyl (PCB) containing capacitors and all polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT) containing electrical equipment .	—	Absent
Mercury containing components, such as switches or backlighting lamps	—	Absent
Batteries	3 6	The batteries are contained in the product.
Printed circuit boards of mobile phones generally, and of other devices if the surface of the printed circuit board is greater than 10 square centimeters	4 9 17	Mainboard SSD Card External Power Adapter Power Supply
Toner cartridges, liquid and paste, as well as color toner	—	Absent
Plastic containing abominated flame retardants	—	Absent

Asbestos waste and components which contain asbestos	–	Absent
Cathode ray tubes	–	Absent
Chlorofluorocarbons (CFC), Hydrochlorofluorocarbons (HCFC) or Hydrofluorocarbons (HFC), Hydrocarbons (HC)	–	Absent
Gas discharge lamps	–	Absent
Liquid crystal displays (together with their casing where appropriate) of a surface greater than 100 square centimeters and all those back-lighted with gas discharge lamps	12 13	LCD Display Module
External electric cables	16	Power Cord
Components containing refractory ceramic fibers	–	Absent
Components containing radioactive substances, or materials that become radioactive	–	Absent
Electrolytic capacitors containing substances of concern (height > 25 mm, diameter > 25 mm or proportionately similar volume)	17	External Power Adapter Power Supply
Beryllium and its compounds (including Beryllium Oxide)	–	Absent
Liquids	–	Absent

Product Take-Back Services

Waste electrical equipment may contain hazardous substances and thus endanger human health & the environment. Proper disposal is therefore required. MSI provides free recycling of EPEAT-registered products to ensure that the product reaches the end of its useful life and that it is recycled responsibly.

To properly recycle your equipment through this service, please follow the steps:

1. Please delete your personal data from your waste equipment.
2. [CLICK HERE](#) to learn how to recycle your end-of-life product.
3. Find the MSI recycling location nearby on the website.
4. Contact the designated recycling location by phone or email to schedule your pickup. The customers are responsible for any shipping and delivery charges.

Using MSI Center

Introduction

MSI Center, the exclusive application created only for MSI's products, delivers optimized performance, and efficiency to gamers and diverse users.

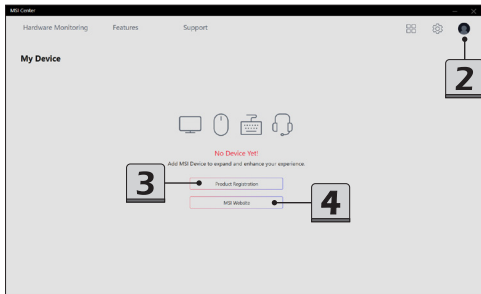
Login and Register

Before using MSI Center, it is recommended to create your own account and register your MSI product to get your full benefits from MSI Center at once.

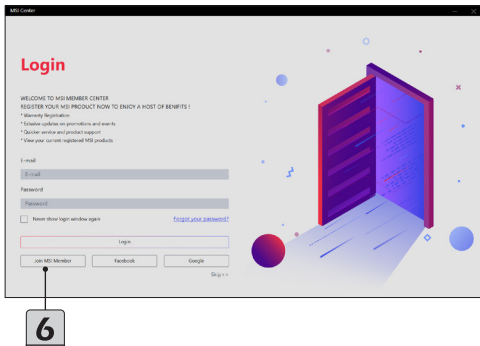
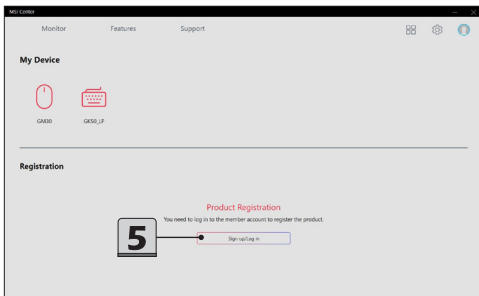
To have the complete function of MSI Center, keep the Windows system login with a single administrator account as specific functions require higher system privileges in order to work (e.g. GPU Switch for Intel 13th Gen laptop models or newer, Fn/Win Key Switch, USB PowerShare, etc...)

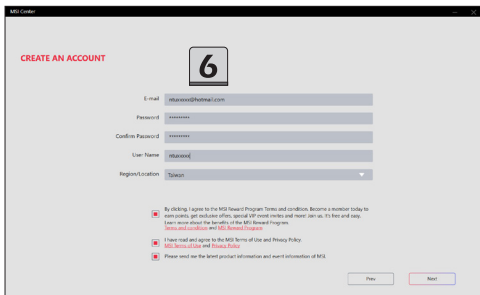
Create an Account

1. Make sure the Internet connection works properly.
 2. Activate MSI Center, move the mouse cursor to the profile icon at the upper right corner and click on it to enter [My Device] page
 3. Click on [Product Registration] to enter Login page.
 4. Click on [MSI Website] to link to MSI official website.
-



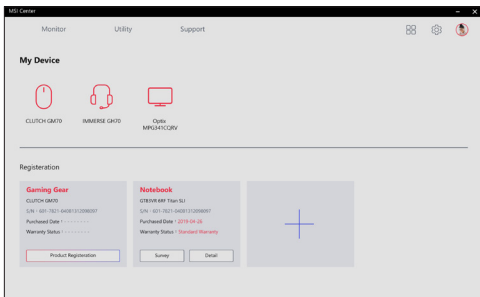
-
5. Connect a MSI device to your laptop, if any. You can also enter the Login page by clicking on [Sign up/ Log in].
 6. Select [Join MSI Member] to create an account, and then follow the on-screen instructions to apply a personal account and register your MSI product.
-





Product Registration

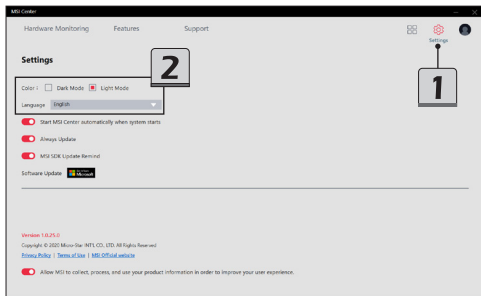
1. Once a personal account is created, and logged in the account, you may start to register your products.
2. The laptop you are using will be detected by MSI Center automatically, follow the on-screen instructions to complete the registration.
3. To register MSI multi-media accessories which are connected to the laptop, click [+] and then follow the on-screen instructions to complete the registration.



Settings

Before using MSI Center, you may decide the appearance and the language of the user interface according to your personal preferences in Settings page.

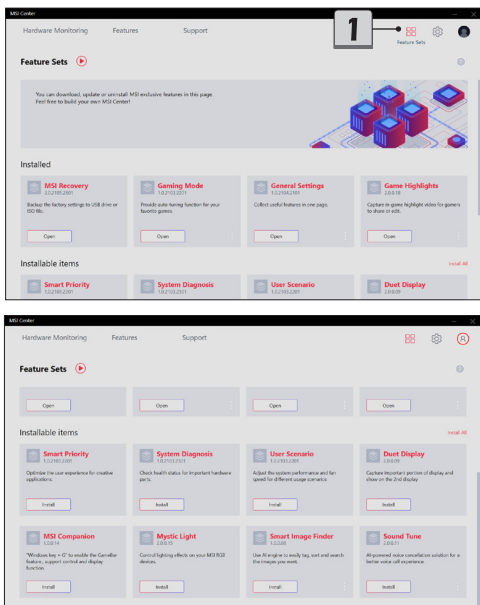
1. Move the mouse cursor to the [Setting] icon at the upper right corner and click on it.
 2. Make selections to the Color, Dark mode or Light mode; and the Language.
-



Feature Sets -- Choose Your Features

Within the latest MSI Center, you are able to choose your own style and features. Simply install or update your favorite features in Feature Sets page. Experience the convenience that MSI Center brings to you!

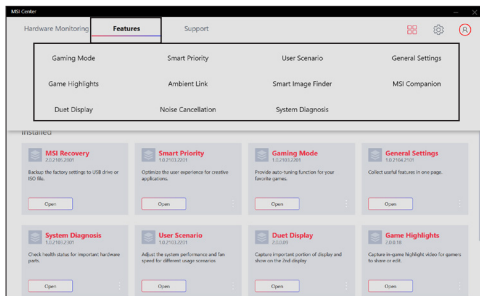
1. Move the mouse cursor to the [Feature Sets] icon at the upper right corner and click on it.
2. In Feature Sets page, feel free to select, install or uninstall any MSI features listed to meet your personal needs.



Features -- Use the Features Installed

Activate MSI Center and click on Features. Find the features which are selected and installed in Feature Sets. Now, let's get familiar to these MSI exclusive features. Here comes the brief introductions to each feature, and you may read it before going any further.

Be noted that the supported features may be varied from models to models.



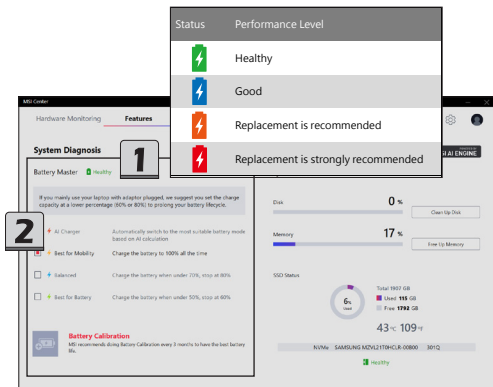
System Diagnosis

System Diagnosis provides real-time battery and system status of the laptop. Use Battery Master to manage the battery with a wiser way; and use System Checker to analyze the storage and memory usage.

Battery Master

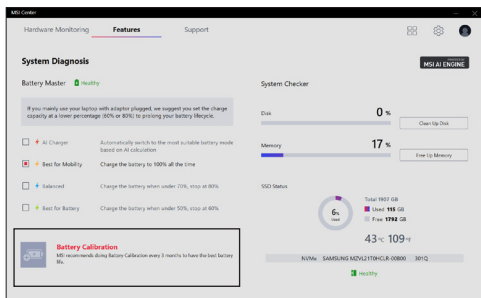
Go to MSI Center [Features > System Diagnostics] and find [Battery Master].

1. Users may distinguish the battery health status by the colors of the battery icon.
 2. Select a suitable Battery modes for different usage.
 - AI Charger: automatically switch to the most suitable battery mode based on AI calculation.
 - Best for Mobility: Charge the battery to 100% at all time.
 - Balanced: Charge the battery when under 70%, and stop charging at 80%.
 - Best for Battery: Charge the battery when under 50%, and stop charging at 60%.
-



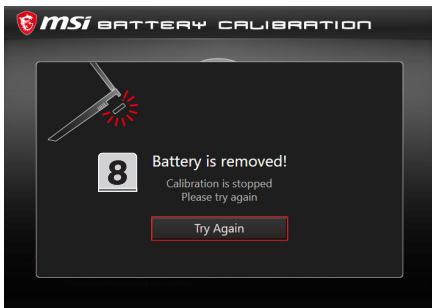
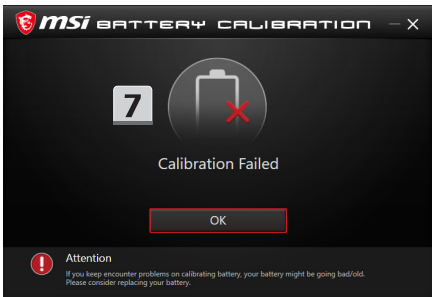
Battery Calibration

Go to MSI Center [Support > System Diagnostics] and find [Battery Calibration](#). Click on the [Battery Calibration] icon.



1. If you are using the Battery Calibration process for the very first time, at the [Status] field, there will be no information telling the date of last calibration.
2. Before starting the Battery Calibration process, it is required to check that the following conditions, a green signal will appear for each item if they meet the requirement:
 - The AC/DC adapter must be connected.
 - The battery must be installed properly.
 - No any other application is activated.
3. A red signal will appear, if any condition listed above does not meet the requirement.
4. Click on the [Start] icon to start the Battery Calibration process.
5. The calibration process status will be shown on the display telling users that the system is now charging, recharging, or discharging.
6. Calibration completed.
MSI recommends doing Battery Calibration every 3 months to have the best battery life.
7. If the calibration process kept going failed, please replace the battery only with the same or equivalent type recommended by the manufacturer. Consult an authorized retailer or service center for further information and assistance.
8. If the AC/DC adapter is disconnected during the calibration process, a warning notification will appear. Please reconnect the AC/DC adapter to continue the calibration process within 15 seconds; otherwise the calibration process will stop automatically.



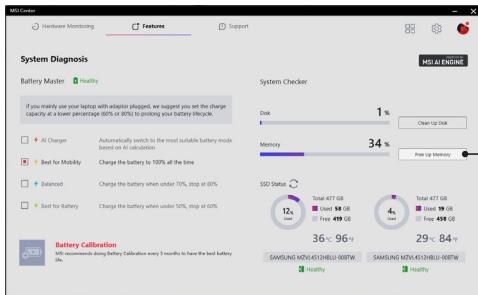
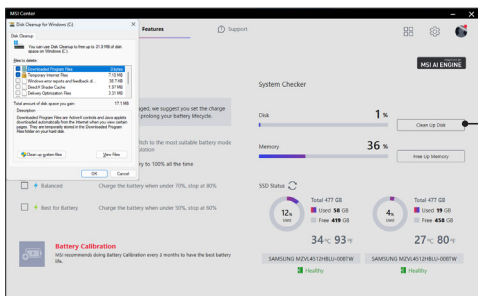



Using MSI Center

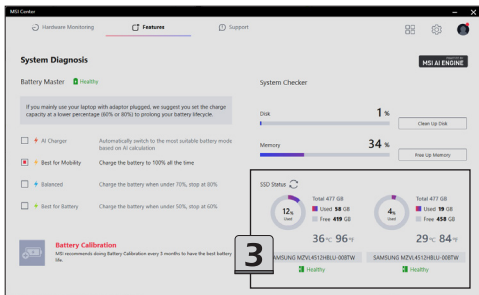
System Checker

Go to MSI Center [Features > System Diagnosis]. Users may read the real-time status of the HDD and SSD storage and memory usage.

1. To clean up the disk, move the mouse cursor to [Clean Up Disk] and right click on it to bring the dialog window of [Disk Cleanup for Windows], and then follow the on-screen instructions to clean up the disk.
2. To free up the memory, simply move the mouse cursor to [Free Up Memory] and right click on it.



3. SSD status provides the information of SSD model, capacity, temperature, health status. Users may distinguish the SSD health status by the colors of the SSD icon. Click the refresh icon  to get the SSD status refreshed when it is needed.



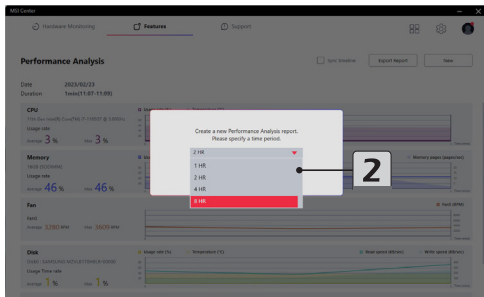
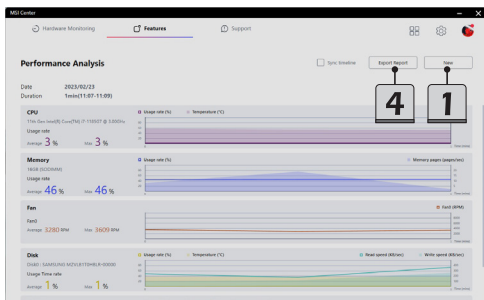
Status	Performance Level
	Healthy
	Good
	Replacement is recommended
	Replacement is strongly recommended

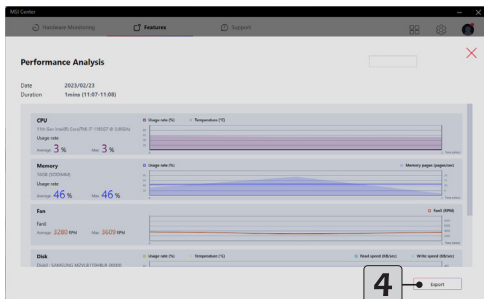
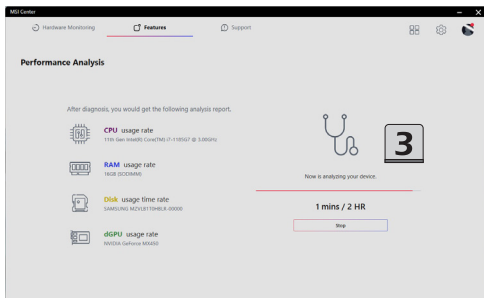
Performance Analysis

Performance Analysis provides system performance analysis report of the laptop. With this function, users may be able to learn the basic system performance whenever is needed.

Go to MSI Center [Features > Performance Analysis].

1. Click on [New] to create a new Performance Analysis report.
2. Specify a time period.
3. Follow the on-screen instructions to generate the report as specified.
4. It is allowed to export the Performance Analysis report by clicking the [Export Report].



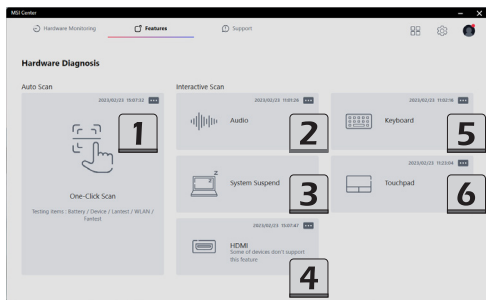


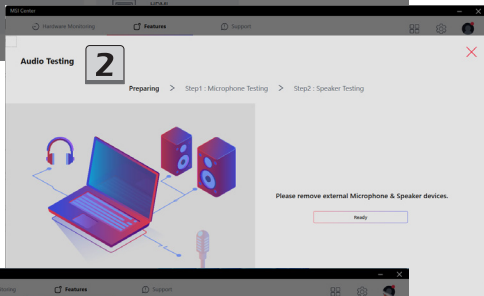
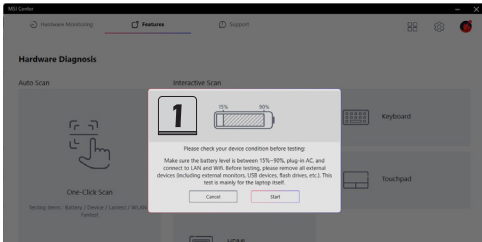
Hardware Diagnosis

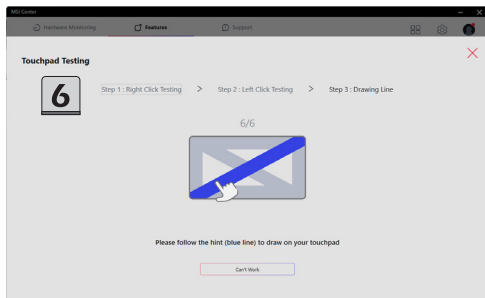
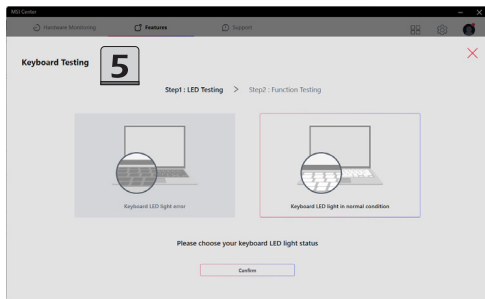
Hardware Diagnosis is capable of doing a quick self-examination for the hardware devices of the laptop.

Go to MSI Center [Features > Hardware Diagnosis], and follow the on-screen instructions to continue the self-examination procedures.

1. One-Click Scan: check the status of the battery, LAN, WLAN, Fan module, etc.
 2. Audio: check the internal audio devices status.
 3. System Suspend: set the system into sleep mode, and auto wake-up the system.
 4. HDMI: check the connection status of HDMI devices.
 5. Keyboard: check the keyboard LED status.
 6. Touchpad: check the touchpad status.
-





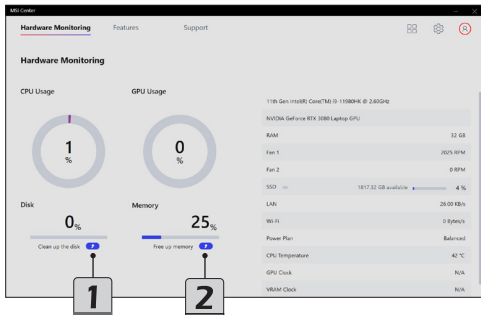


Hardware Monitoring

Monitor provides a real-time status of the CPU Usage and GPU Usage.

Activate MSI Center and click on Monitor to browse the page.

1. Click and follow the on-screen instructions to clean up the appointed disk.
 2. Click to free up the memory.
-



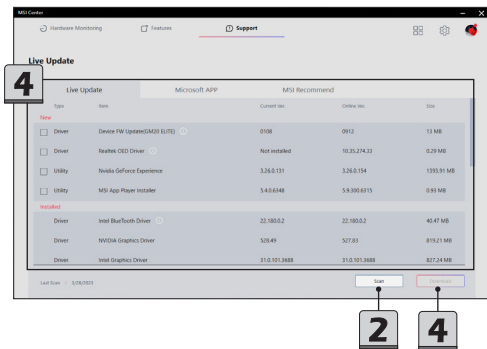
Support

Within **Support** page, you may find the advanced functions included: Live Update, System Info, MSI Recovery and Knowledge Base.

Live Update

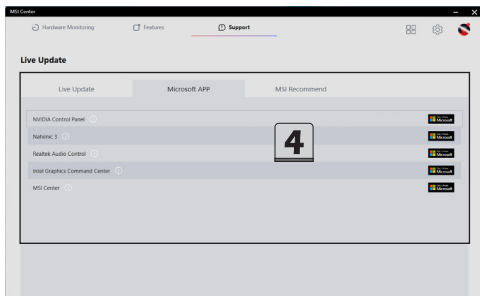
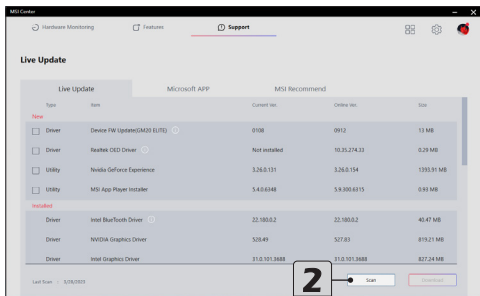
Live Update

1. Connect to Internet, and go to MSI Center [Support > Live Update].
 2. Move the mouse cursor to [Scan] icon, and click on it.
 3. Live Update is capable to analyze the system automatically and give a list with every latest drivers and utilities available for updating.
 4. Select a required driver or utility for updating, and then click [Download] to continue. Follow the on-screen instructions to complete the installation.
 5. You may read the message [No Internet connection]. Please connect to the Internet and retry], please check the Internet connection.
-



Microsoft APP

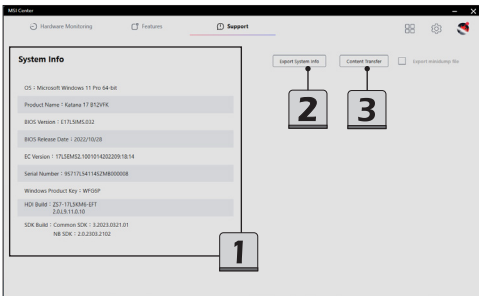
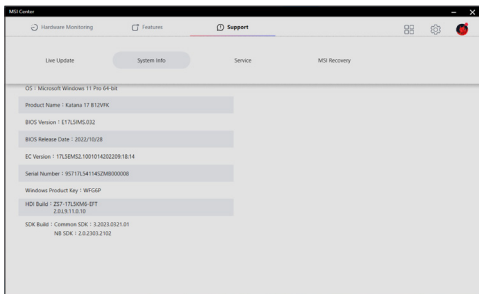
1. To use this function for the very first time, analyzing the system by Live Update is a must.
 2. Connect to internet, go to MSI Center [Support > Live Update], and click [Scan] icon.
 3. Go to Microsoft app now, users will get a list with compatible utilities.
 4. Select a desired utility, and follow the on-screen instructions to downloading the APP.
-

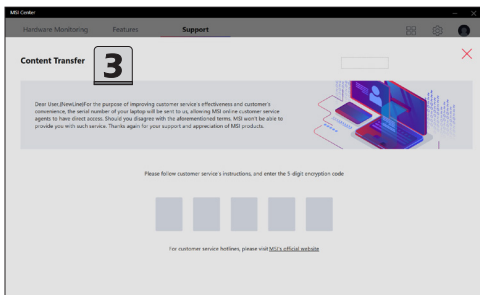
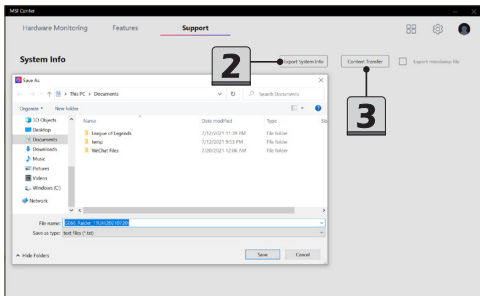


System Info

Go to MSI Center [Support > System Info].

1. System Info: Read-only system information provided here.
2. Export System Info: Export the current system information data to a .txt file.
3. Content Transfer: Use this function when contacting MSI online customer service agents. Follow the instructions given by the online agent to continue.





Service

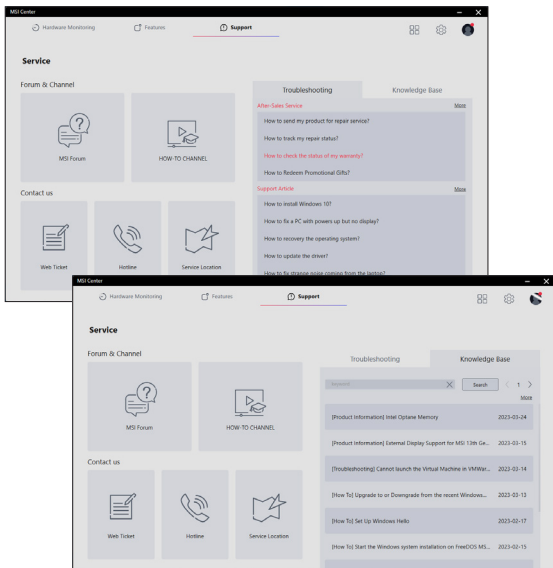
Trouble Shooting and Knowledge Base

In Trouble Shooting and Knowledge Base page, user can find a list of frequently asked questions and answers, giving them possible instructions to solve basic situations.

Go to MSI Center [Support > Service].

Users can search for related information by searching for the keywords in the search toolbar.

Move the mouse cursor to click on [More] to get more information at MSI official website.



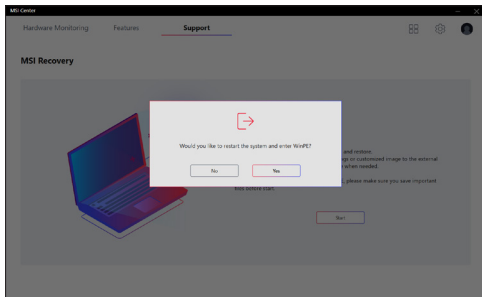
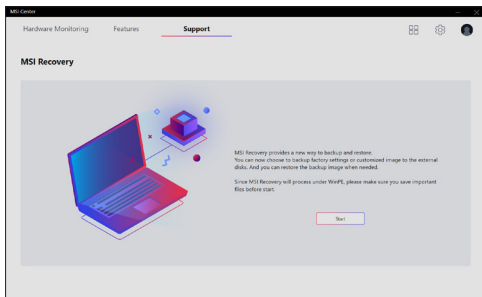
MSI Recovery

Use this function to make a recovery image to a USB flash disk to recover the system back to the initial status of original manufacturer's default settings, or the customized recovery point.

Be aware of backing up the important data to other storage devices before using this recovery function is a must.

Go to WinPE to Use MSI Recovery

1. Go to MSI Center [Support > MSI Recovery].
 2. Click [Start] and then [Yes] to enter MSI Recovery main page under WinPE.
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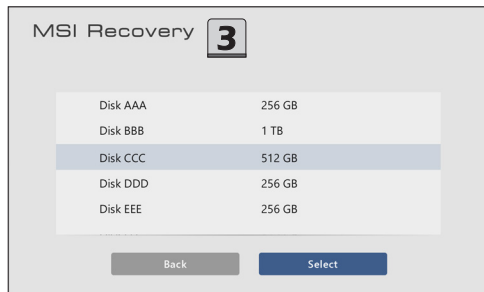


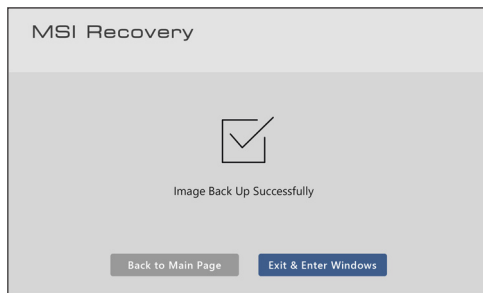
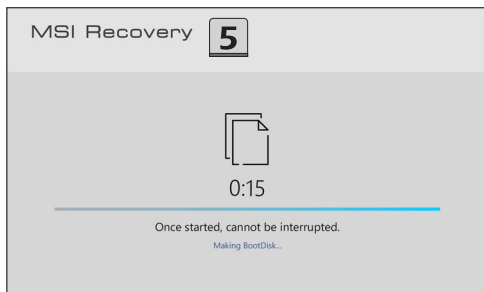
Create a MSI Rescue USB disk

1. To use MSI Recovery function for the very first time, it is a must to make a **MSI Rescue USB disk** first. With MSI Rescue USB disk, users may be able to fix or restore the system back to the factory default settings while the system encountering problems booting to Windows. Select [Backup] to start making MSI Rescue USB disk.



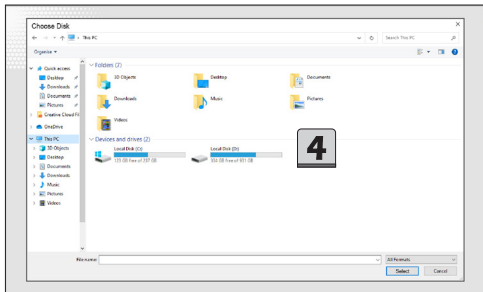
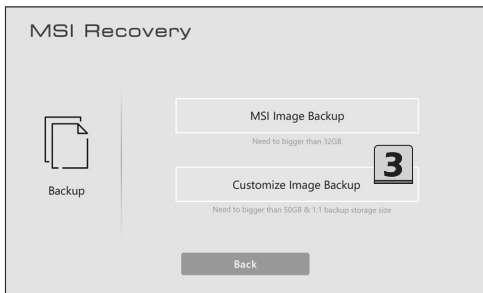
-
2. Insert an USB flash disk with minimum capacity 32GB required.
Click [Next] to continue.
 3. Select the path of the inserted USB flash disk and then click [Select] to continue.
 4. Be noted that making a **MSI Rescue USB disk**, the USB flash disk will be formatted, all data will lost.
 5. Follow the on-screen instructions to complete creating the **MSI Rescue USB disk**.
 6. Keep the **MSI Rescue USB disk** properly, it will be used whenever you perform the Backup and Restore functions.
-





Create a Customize Image Backup

1. To make a Customize Image Backup, always be sure to have the **MSI Rescue USB disk** inserted to the laptop.
 2. Insert another USB flash disk or connect a hard disk with available capacity required.
 3. Select [Customize Image Backup] to continue.
 4. Select the path of the inserted USB flash disk or the connected hard disk, then select [Select] to continue.
 5. Follow the on-screen instructions to complete creating the Customize Image Backup in a *.wim file format.
 6. Keep the backup file properly, it will be used while performing the Restore function.
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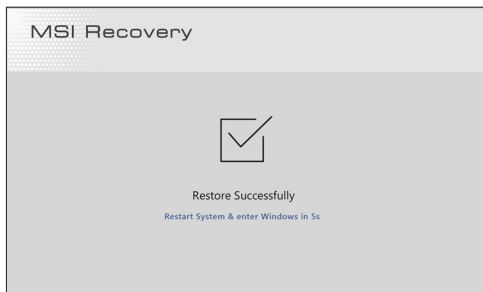


Recovering the System

If the hard drive or the system encountered non-recoverable problems, it is recommended to proceed the MSI recovery function with the MSI Image Backup or Customize Image Backup which you made in advance.

1. Go to MSI Recovery main page, and select [Restore].
 2. To perform the Restore function, always make sure that the **MSI Rescue USB disk** is inserted to the laptop.
 3. Connect the storage drive, where you can find the Customize Image Backup *.wim file, to your laptop.
 4. You may restore the system from MSI Image Backup to have the system restored back to the factory default settings.
 5. Or, to restore the system from the Customize Image Backup by finding and selecting the *.wim file from the connected storage drive to have the system restored back to a specific point in time. Click [Select] to continue.
 6. AC power is required while proceeding MSI Recovery function. Assure that the AC power is connected to the laptop before moving forward to the next step.
 7. Always make sure that the important data has been backed up before continuing MSI Recovery process.
 8. Follow the on-screen instructions to continue and complete MSI Recovery process.
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SUPPORT



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