OptiPlex 7090 Ultra

Service Manual

Regulatory Model: D13U
Regulatory Type: D13U002
August 2021
Rev. A01

Notes, cautions, and warnings

NOTE: A NOTE indicates important information that helps you make better use of your product.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

Contents

1

Working on your computer

Topics:

- Safety instructions

Safety instructions

Use the following safety guidelines to protect your computer from potential damage and to ensure your personal safety. Unless otherwise noted, each procedure included in this document assumes that you have read the safety information that shipped with your computer.

WARNING: Before working inside your computer, read the safety information that is shipped with your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

WARNING: Disconnect your computer from all power sources before opening the computer cover or panels. After you finish working inside the computer, replace all covers, panels, and screws before connecting your computer to an electrical outlet.

CAUTION: To avoid damaging the computer, ensure that the work surface is flat, dry, and clean.

CAUTION: To avoid damaging the components and cards, handle them by their edges, and avoid touching the pins and the contacts.

CAUTION: You should only perform troubleshooting and repairs as authorized or directed by the Dell technical assistance team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. See the safety instructions that is shipped with the product or at www.dell.com/regulatory_compliance.

CAUTION: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate static electricity which could harm internal components.

CAUTION: When you disconnect a cable, pull it by its connector or its pull tab, not the cable itself. Some cables have connectors with locking tabs or thumbscrews that you must disengage before disconnecting the cable. When disconnecting cables, keep them evenly aligned to avoid bending the connector pins. When connecting cables, ensure that the ports and the connectors are correctly oriented and aligned.

CAUTION: Press and eject any installed card from the media-card reader.

CAUTION: Exercise caution when handling Lithium-ion batteries in laptops. Swollen batteries should not be used and should be replaced and disposed properly.

NOTE: The color of your computer and certain components may appear differently than shown in this document.

Before working inside your device

About this task

To avoid damaging your device, perform the following steps before you begin working inside the device:

Steps

1. Ensure that you follow the Safety Instruction.

2. Ensure that your work surface is flat and clean to prevent the device cover from being scratched.
3. Save and close all open files and exit all open applications.
4. Turn off your device.
5. Disconnect your device and all attached devices from their electrical outlets.

Safety precautions

The safety precautions chapter details the primary steps to be taken before performing any disassembly instructions.

Observe the following safety precautions before you perform any installation or break/fix procedures involving disassembly or reassembly:

- Turn off the system and all attached peripherals.
- Disconnect the system and all attached peripherals from AC power.
- Disconnect all network cables, telephone, and telecommunications lines from the system.
- Use an ESD field service kit when working inside any desktop to avoid electrostatic discharge (ESD) damage.
- After removing any system component, carefully place the removed component on an anti-static mat.
- Wear shoes with non-conductive rubber soles to reduce the chance of getting electrocuted.

Standby power

Dell products with standby power must be unplugged before you open the case. Systems that incorporate standby power are essentially powered while turned off. The internal power enables the system to be remotely turned on (wake on LAN) and suspended into a sleep mode and has other advanced power management features.

Unplugging, pressing and holding the power button for 20 seconds should discharge residual power in the system board.

Bonding

Bonding is a method for connecting two or more grounding conductors to the same electrical potential. This is done through the use of a field service electrostatic discharge (ESD) kit. When connecting a bonding wire, ensure that it is connected to bare metal and never to a painted or non-metal surface. The wrist strap should be secure and in full contact with your skin, and ensure that you remove all jewelry such as watches, bracelets, or rings prior to bonding yourself and the equipment.

Electrostatic discharge—ESD protection

ESD is a major concern when you handle electronic components, especially sensitive components such as expansion cards, processors, memory DIMMs, and system boards. Very slight charges can damage circuits in ways that may not be obvious, such as intermittent problems or a shortened product life span. As the industry pushes for lower power requirements and increased density, ESD protection is an increasing concern.

Due to the increased density of semiconductors used in recent Dell products, the sensitivity to static damage is now higher than in previous Dell products. For this reason, some previously approved methods of handling parts are no longer applicable.

Two recognized types of ESD damage are catastrophic and intermittent failures.

- **Catastrophic** – Catastrophic failures represent approximately 20 percent of ESD-related failures. The damage causes an immediate and complete loss of device functionality. An example of catastrophic failure is a memory DIMM that has received a static shock and immediately generates a "No POST/No Video" symptom with a beep code emitted for missing or nonfunctional memory.
- **Intermittent** – Intermittent failures represent approximately 80 percent of ESD-related failures. The high rate of intermittent failures means that most of the time when damage occurs, it is not immediately recognizable. The DIMM receives a static shock, but the tracing is merely weakened and does not immediately produce outward symptoms related to the damage. The weakened trace may take weeks or months to melt, and in the meantime may cause degradation of memory integrity, intermittent memory errors, etc.

The more difficult type of damage to recognize and troubleshoot is the intermittent (also called latent or "walking wounded") failure.

Perform the following steps to prevent ESD damage:

- Use a wired ESD wrist strap that is properly grounded. The use of wireless anti-static straps is no longer allowed; they do not provide adequate protection. Touching the chassis before handling parts does not ensure adequate ESD protection on parts with increased sensitivity to ESD damage.
- Handle all static-sensitive components in a static-safe area. If possible, use anti-static floor pads and workbench pads.
- When unpacking a static-sensitive component from its shipping carton, do not remove the component from the anti-static packing material until you are ready to install the component. Before unwrapping the anti-static packaging, ensure that you discharge static electricity from your body.
- Before transporting a static-sensitive component, place it in an anti-static container or packaging.

ESD field service kit

The unmonitored Field Service kit is the most commonly used service kit. Each Field Service kit includes three main components: anti-static mat, wrist strap, and bonding wire.

Components of an ESD field service kit

The components of an ESD field service kit are:

- **Anti-Static Mat** – The anti-static mat is dissipative and parts can be placed on it during service procedures. When using an anti-static mat, your wrist strap should be snug and the bonding wire should be connected to the mat and to any bare metal on the system being worked on. Once deployed properly, service parts can be removed from the ESD bag and placed directly on the mat. ESD-sensitive items are safe in your hand, on the ESD mat, in the system, or inside a bag.
- **Wrist Strap and Bonding Wire** – The wrist strap and bonding wire can be either directly connected between your wrist and bare metal on the hardware if the ESD mat is not required, or connected to the anti-static mat to protect hardware that is temporarily placed on the mat. The physical connection of the wrist strap and bonding wire between your skin, the ESD mat, and the hardware is known as bonding. Use only Field Service kits with a wrist strap, mat, and bonding wire. Never use wireless wrist straps. Always be aware that the internal wires of a wrist strap are prone to damage from normal wear and tear, and must be checked regularly with a wrist strap tester in order to avoid accidental ESD hardware damage. It is recommended to test the wrist strap and bonding wire at least once per week.
- **ESD Wrist Strap Tester** – The wires inside of an ESD strap are prone to damage over time. When using an unmonitored kit, it is a best practice to regularly test the strap prior to each service call, and at a minimum, test once per week. A wrist strap tester is the best method for doing this test. If you do not have your own wrist strap tester, check with your regional office to find out if they have one. To perform the test, plug the wrist-strap's bonding-wire into the tester while it is strapped to your wrist and push the button to test. A green LED is lit if the test is successful; a red LED is lit and an alarm sounds if the test fails.
- **Insulator Elements** – It is critical to keep ESD sensitive devices, such as plastic heat sink casings, away from internal parts that are insulators and often highly charged.
- **Working Environment** – Before deploying the ESD Field Service kit, assess the situation at the customer location. For example, deploying the kit for a server environment is different than for a desktop or portable environment. Servers are typically installed in a rack within a data center; desktops or portables are typically placed on office desks or cubicles. Always look for a large open flat work area that is free of clutter and large enough to deploy the ESD kit with additional space to accommodate the type of system that is being repaired. The workspace should also be free of insulators that can cause an ESD event. On the work area, insulators such as Styrofoam and other plastics should always be moved at least 12 inches or 30 centimeters away from sensitive parts before physically handling any hardware components
- **ESD Packaging** – All ESD-sensitive devices must be shipped and received in static-safe packaging. Metal, static-shielded bags are preferred. However, you should always return the damaged part using the same ESD bag and packaging that the new part arrived in. The ESD bag should be folded over and taped shut and all the same foam packing material should be used in the original box that the new part arrived in. ESD-sensitive devices should be removed from packaging only at an ESD-protected work surface, and parts should never be placed on top of the ESD bag because only the inside of the bag is shielded. Always place parts in your hand, on the ESD mat, in the system, or inside an anti-static bag.
- **Transporting Sensitive Components** – When transporting ESD sensitive components such as replacement parts or parts to be returned to Dell, it is critical to place these parts in anti-static bags for safe transport.

ESD protection summary

It is recommended that all field service technicians use the traditional wired ESD grounding wrist strap and protective anti-static mat at all times when servicing Dell products. In addition, it is critical that technicians keep sensitive parts separate from all insulator parts while performing service and that they use anti-static bags for transporting sensitive components.

Transporting sensitive components

When transporting ESD sensitive components such as replacement parts or parts to be returned to Dell, it is critical to place these parts in anti-static bags for safe transport.

After working inside your device

About this task

After you complete any replacement procedure, ensure that you connect any external devices, cards, and cables before turning on your device.

Steps

1. Replace all screws and ensure that no stray screws remain inside your device.
2. Connect your computer and all attached devices to their electrical outlets.
3. Turn on your device.
4. If required, verify that the device works correctly by running **ePSA diagnostics**.

2

Stands

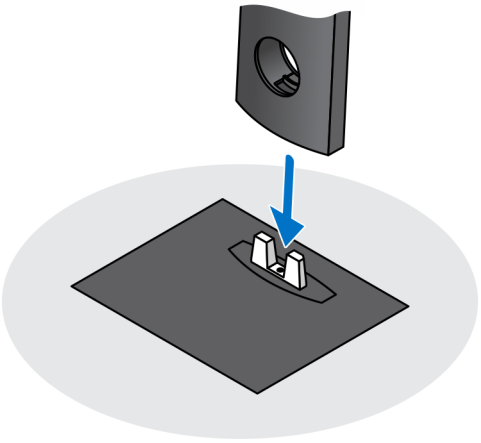
Topics:

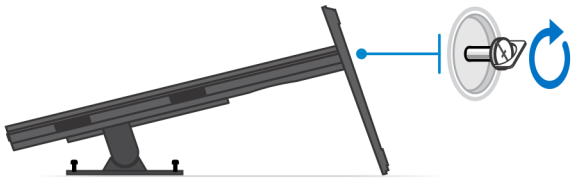
Fixed stand

Installing the device on a fixed stand

Steps

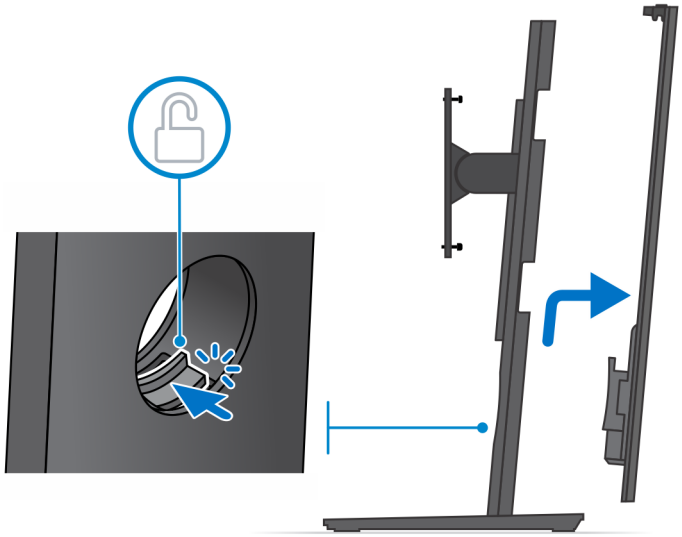
1. Align and insert the slots on the fixed stand into the tab on the stand base.
2. Lift and tilt the stand base.
3. Tighten the captive screw to secure the stand to the base.



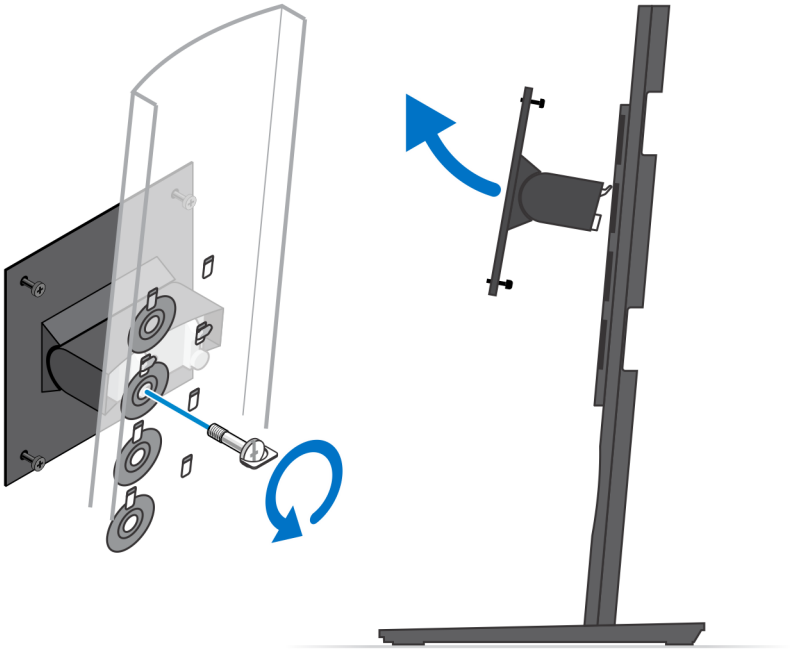


4. Slide the release latch on the stand, until you hear a click, to release the stand cover.

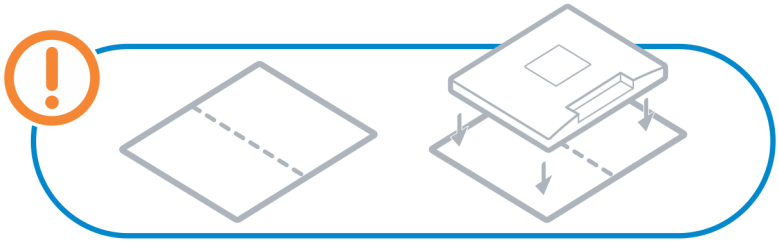
5. Slide and lift the cover to release it from the stand.

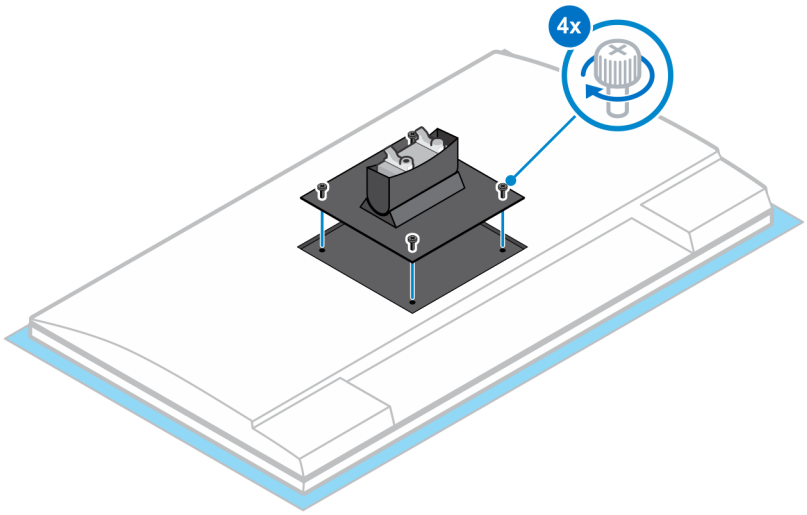


6. Remove the screw that secures the stand mounting bracket to the stand.
7. Lift the mounting bracket to release the hooks on the bracket from the slots on the stand.

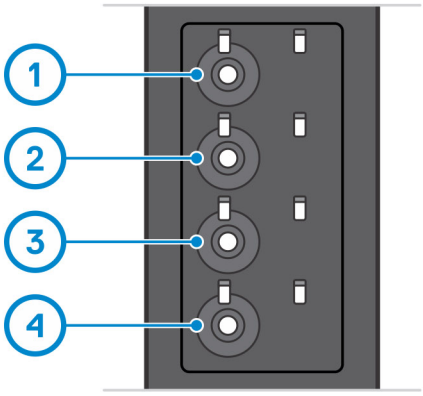


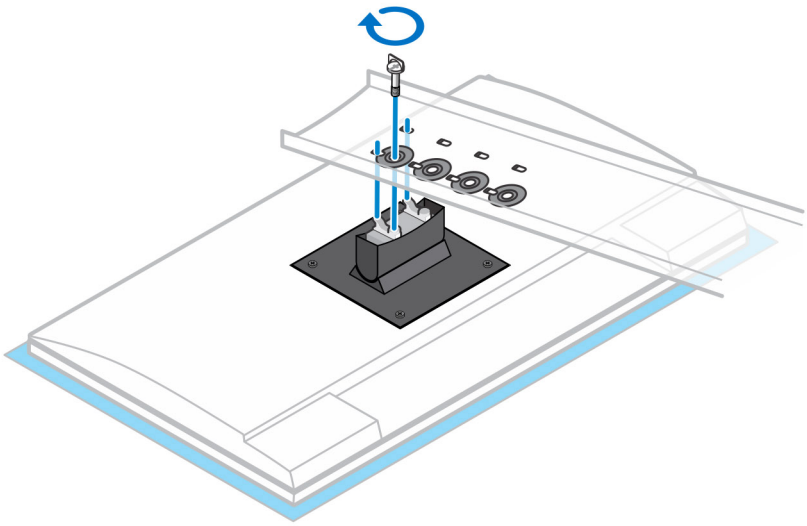
8. To avoid any damage to the monitor, ensure that you place the monitor on a protective sheet.
9. Align the screws on the mounting bracket with the screw holes on the monitor.
10. Tighten the four captive screws to secure the mounting bracket to the monitor.



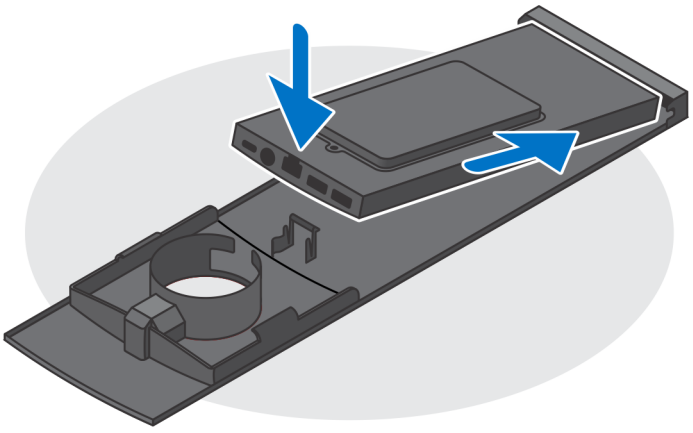


11. Select the height at which you want to mount the monitor and align the hooks on the mounting bracket with the slots on the stand.
12. Replace the screw to secure the fixed stand to the monitor.





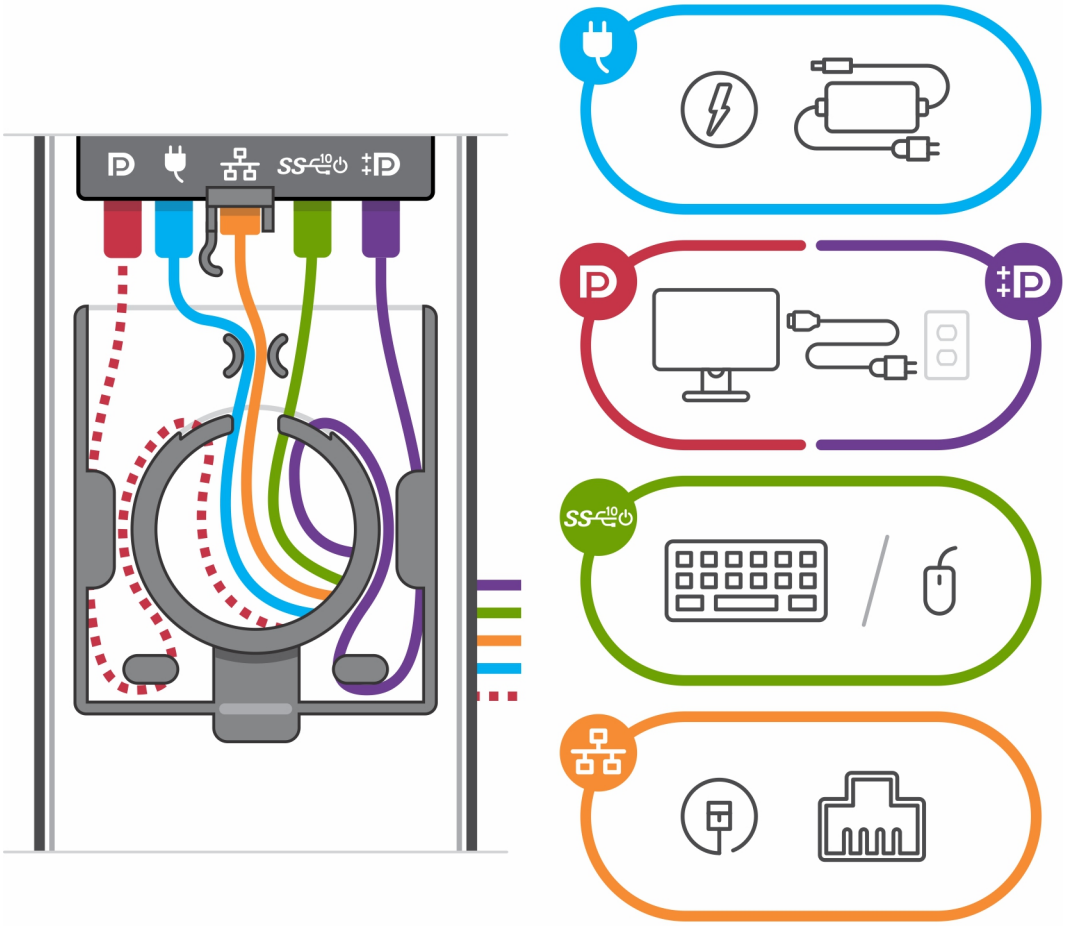
13. Align the vents on the device with the vents on the stand cover.
14. Lower the device in the stand until you hear a click.



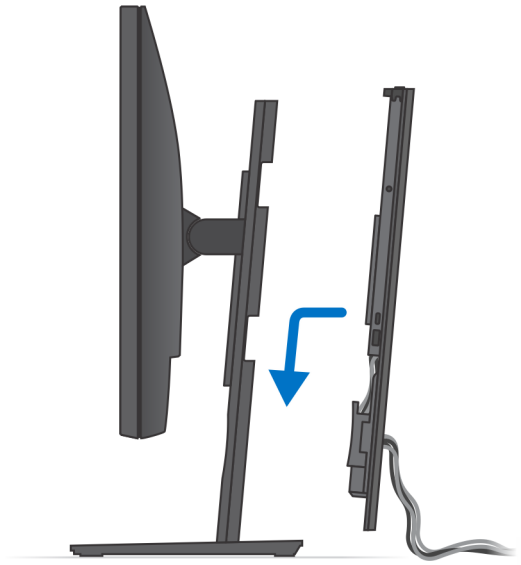
15. Connect the power, network, keyboard, mouse, and display cables to the device and to the power outlet.

NOTE: To avoid any pinching or crimping of the cables while closing the stand cover, it is recommended that you route the cables as indicated in the image.

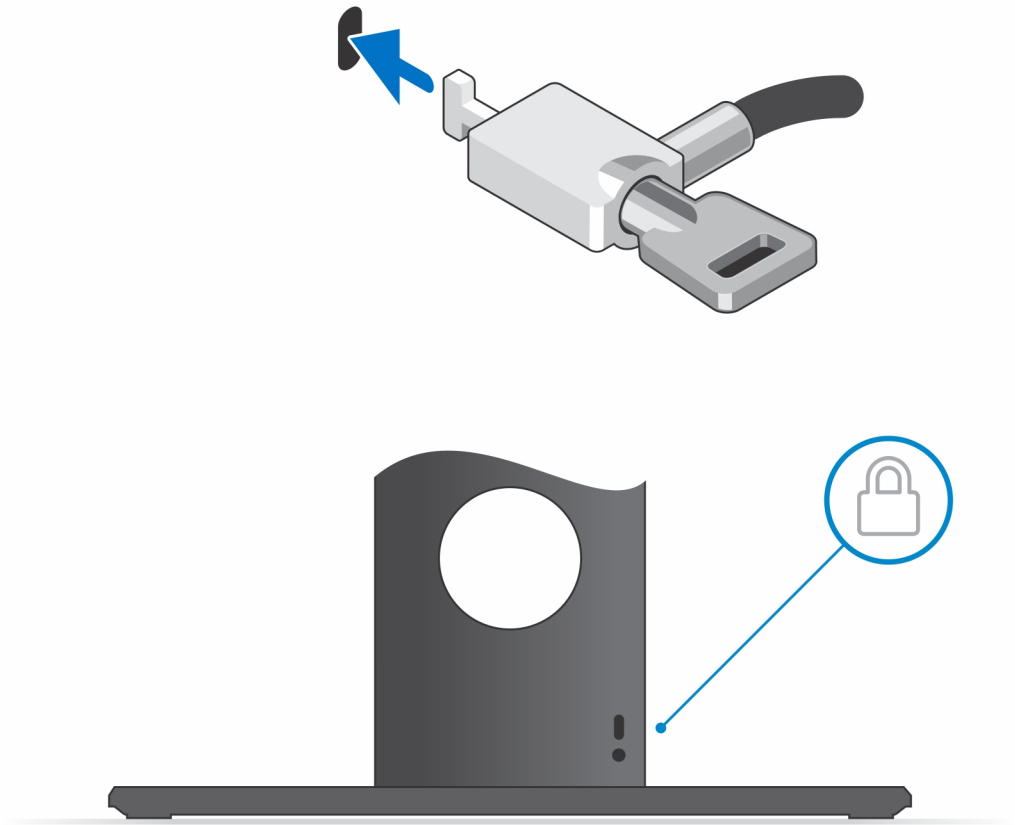
NOTE: All the cables and ports are used depending on the peripherals chosen and the configuration of the computer.



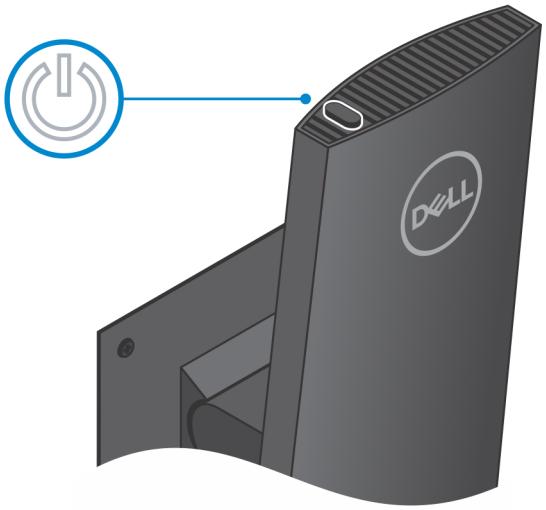
16. Slide the back cover, along with the device, into the stand until you hear a click.



17. Lock the device and the stand cover.



18. Press the power button to turn on the device.



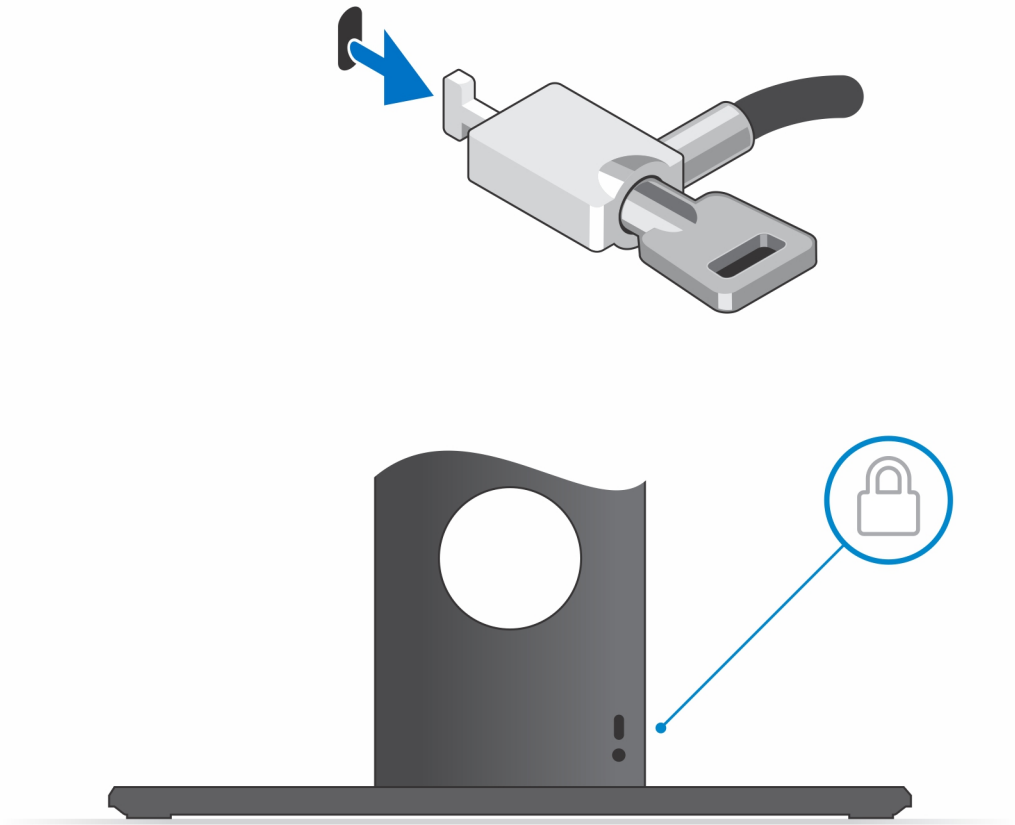
Removing the device from a fixed stand

Prerequisites

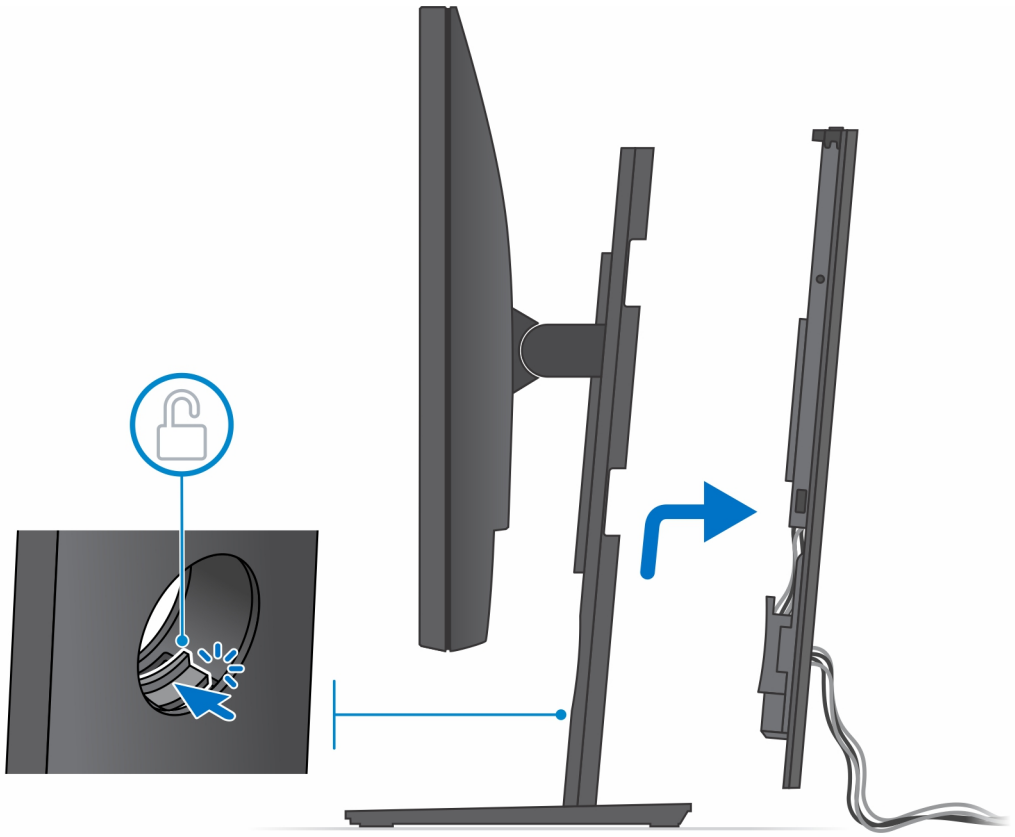
1. Follow the procedure in before working inside your device.

Steps

1. Unlock the device and the stand cover.

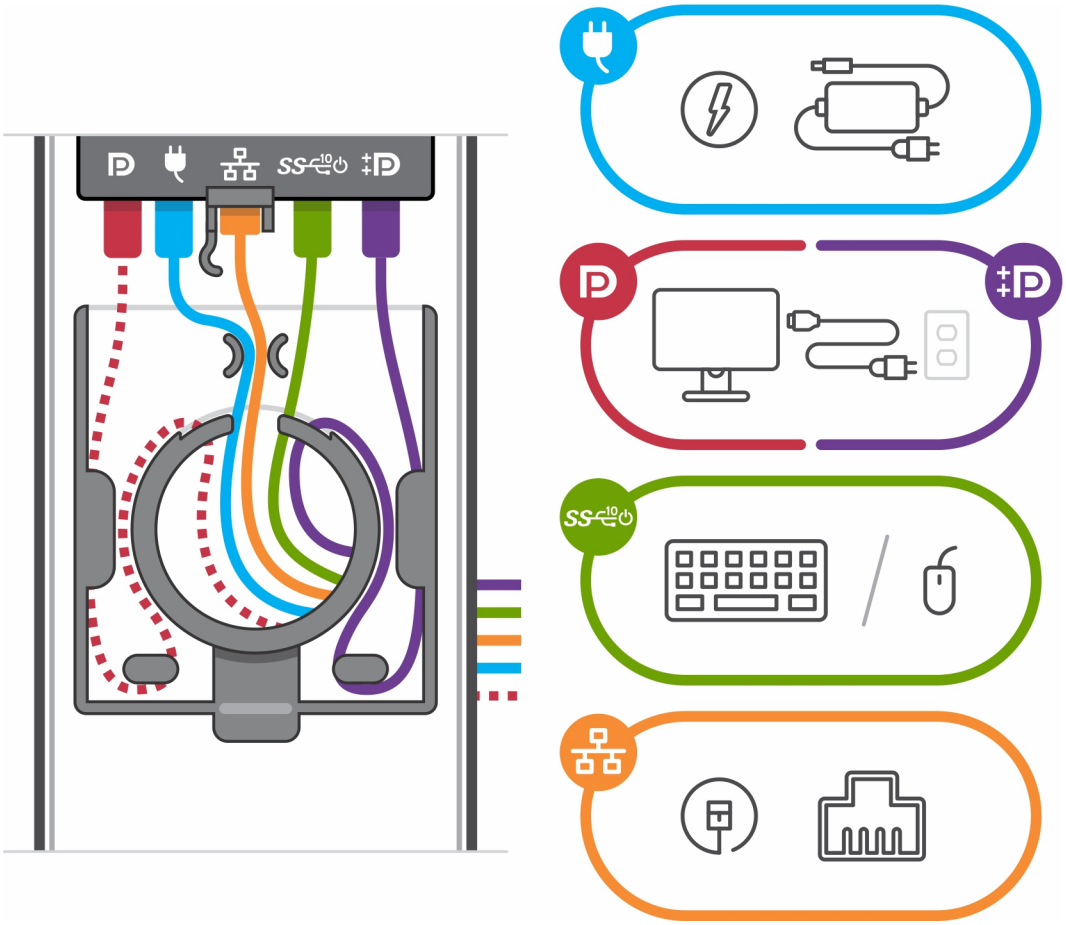


2. Slide the release latch on the stand until you hear a click to release the stand cover.
3. Slide and lift the back cover to release it from the stand.

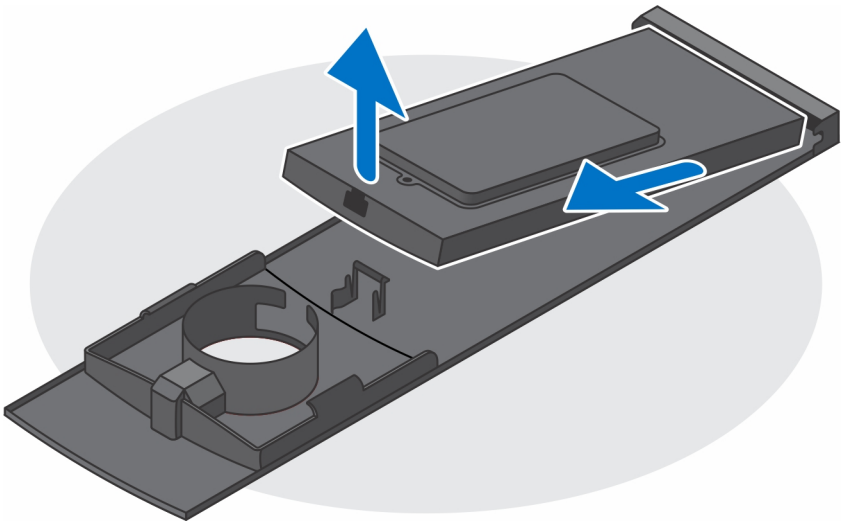


4. Disconnect the keyboard, mouse, network, power, and display cable from the device.

NOTE: All the cables and ports are used depending on the peripherals chosen and the configuration of the computer.



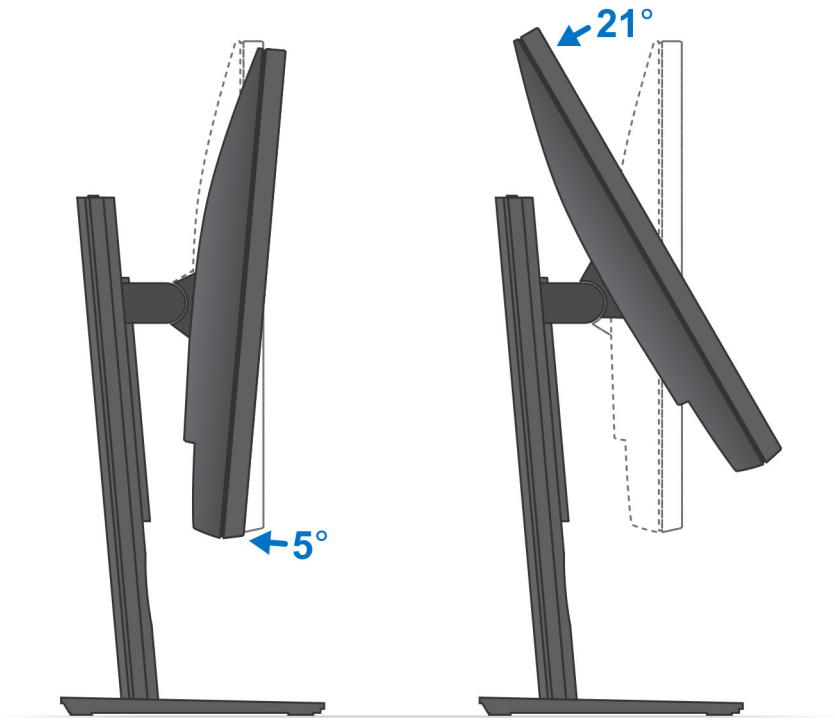
5. Pull the retention latch that secures the device to the stand chassis.
6. Lift the device from the cover.



7. Press and hold the power button while the device is unplugged to ground the system board.

NOTE: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface at the same time as touching a connector on the back of the computer.

Monitor tilt angle

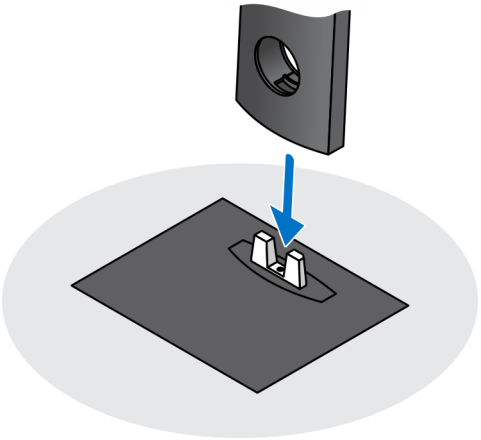


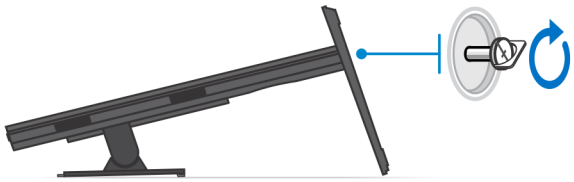
Pro 1.0 Height-adjustable stand-HAS

Installing the device on a Pro 1 height-adjustable stand

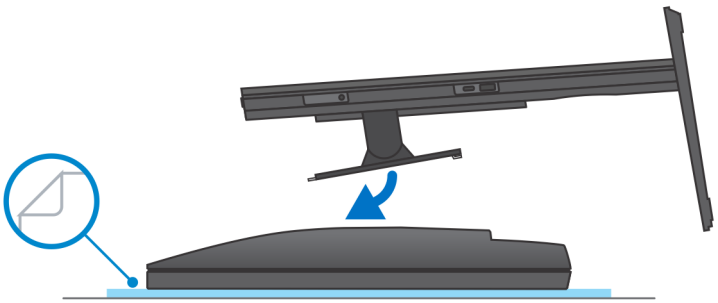
Steps

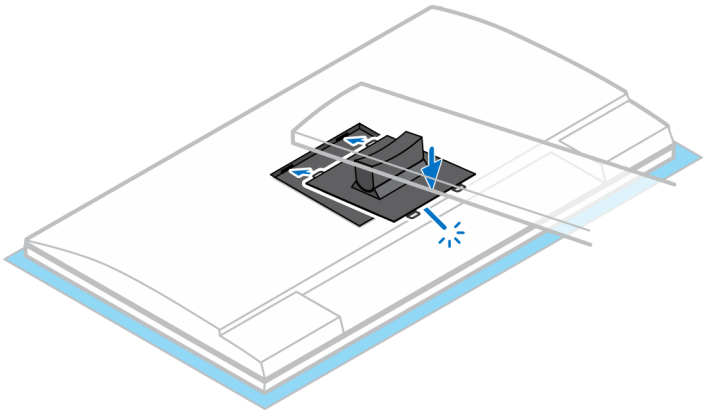
1. Align and insert the slots on the height-adjustable stand into the tab on the stand base.
2. Lift and tilt the stand base.
3. Tighten the captive screw to secure the stand to the base.



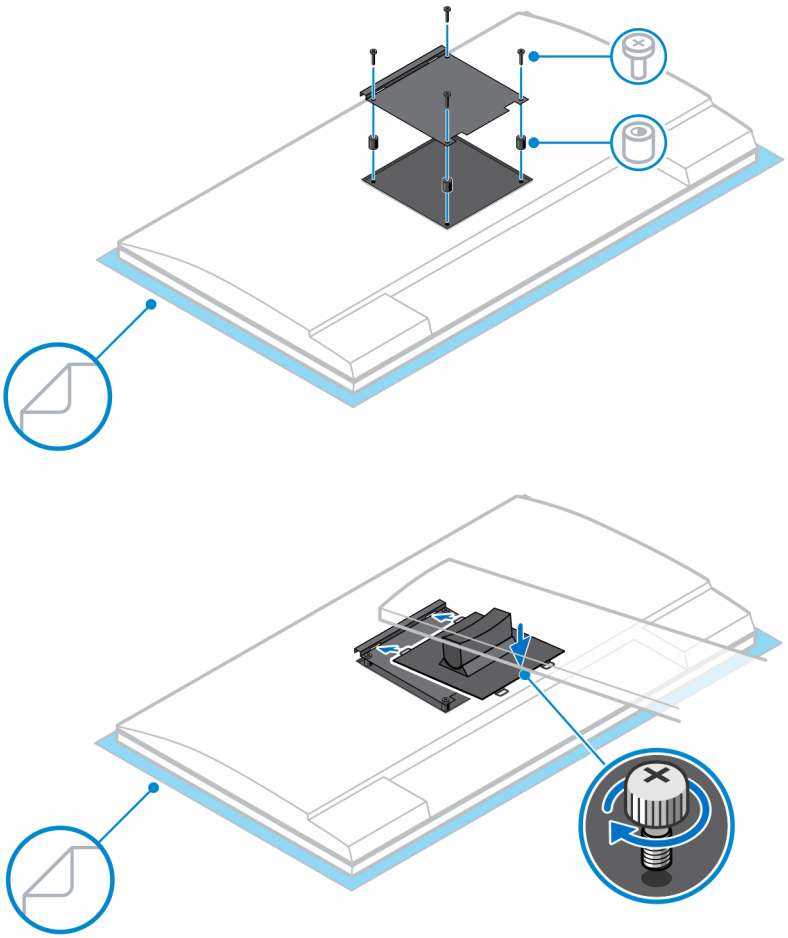


4. To avoid any damage to the monitor, ensure that you place the monitor on a protective sheet.
5. For installing the height-adjustable stand to the monitor:
   a. Align and insert the hooks on the mounting bracket on the stand into the slots on the monitor, until you hear a click.

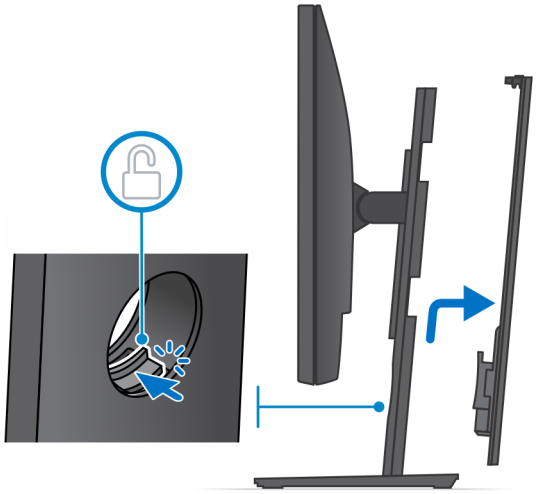


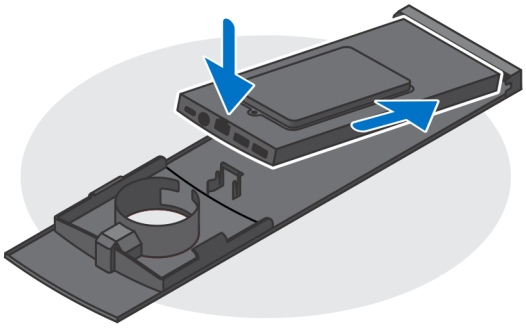


6. For installing QR to VESA bracket for E-Series monitor or monitor without Quick Release support:
   a. Align the screw holes on the QR to VESA bracket with the screw holes on the monitor.
   b. Install the four screw spacers and the screws to secure the QR to VESA bracket to the monitor.
   c. Align and insert the QR tabs on the stand into the slots on the QR to VESA bracket on the monitor.
   d. Tighten the thumb screw to secure the stand to the QR to VESA bracket.



7. To release the stand cover, slide the release latch until you hear a click.
8. Slide and lift the cover to release it from the stand.
9. Align the vents on the device with the vents on the stand cover.
10. Lower the device in the stand until you hear a click.

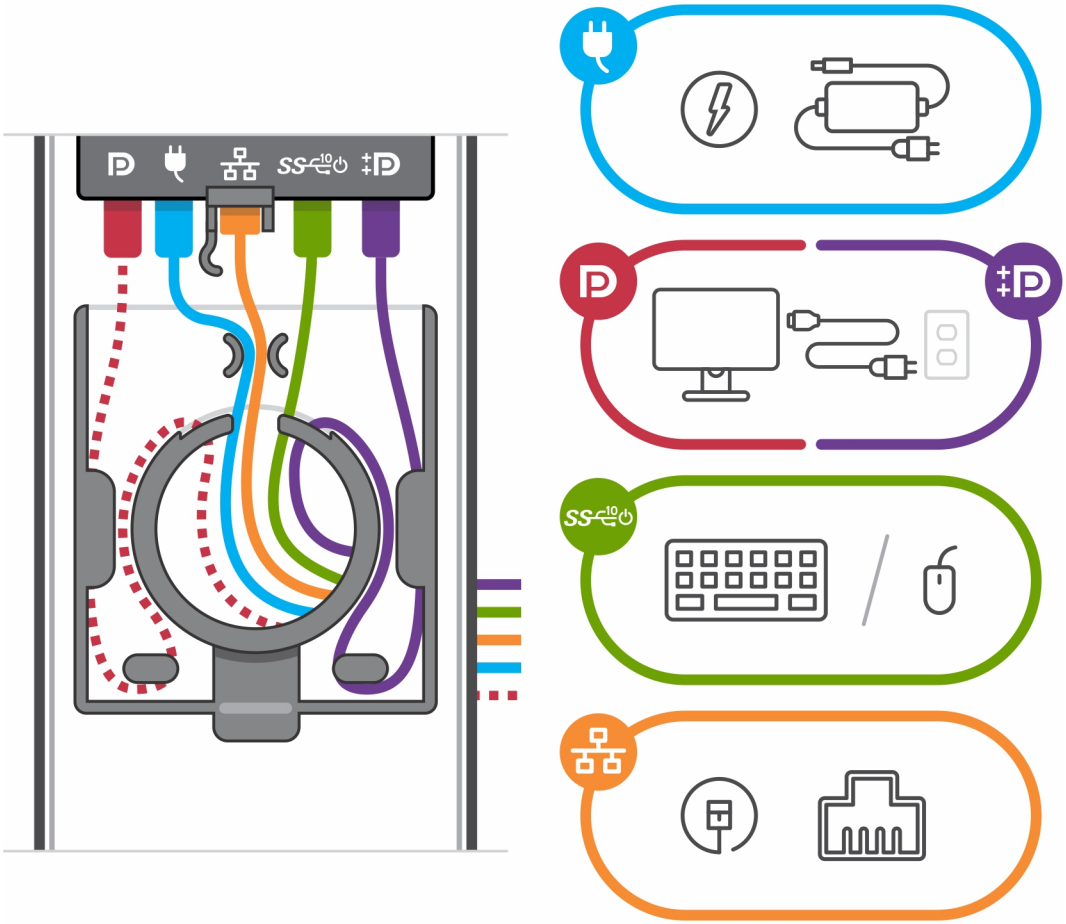




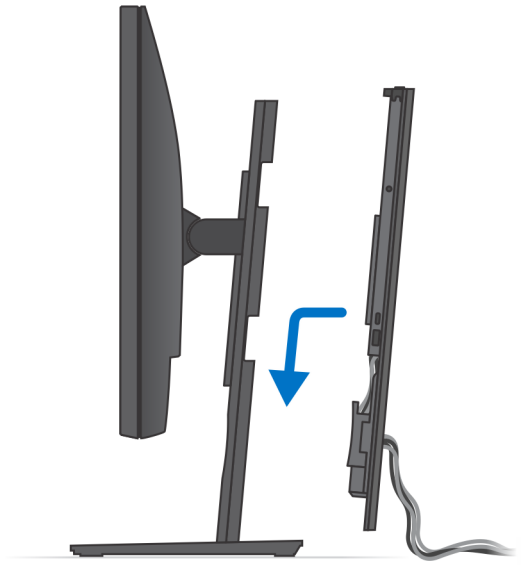
11. Connect the power, network, keyboard, mouse, and display cables to the device and to the power outlet.

NOTE: To avoid any pinching or crimping of the cables while closing the stand cover, it is recommended that you route the cables as indicated in the image.

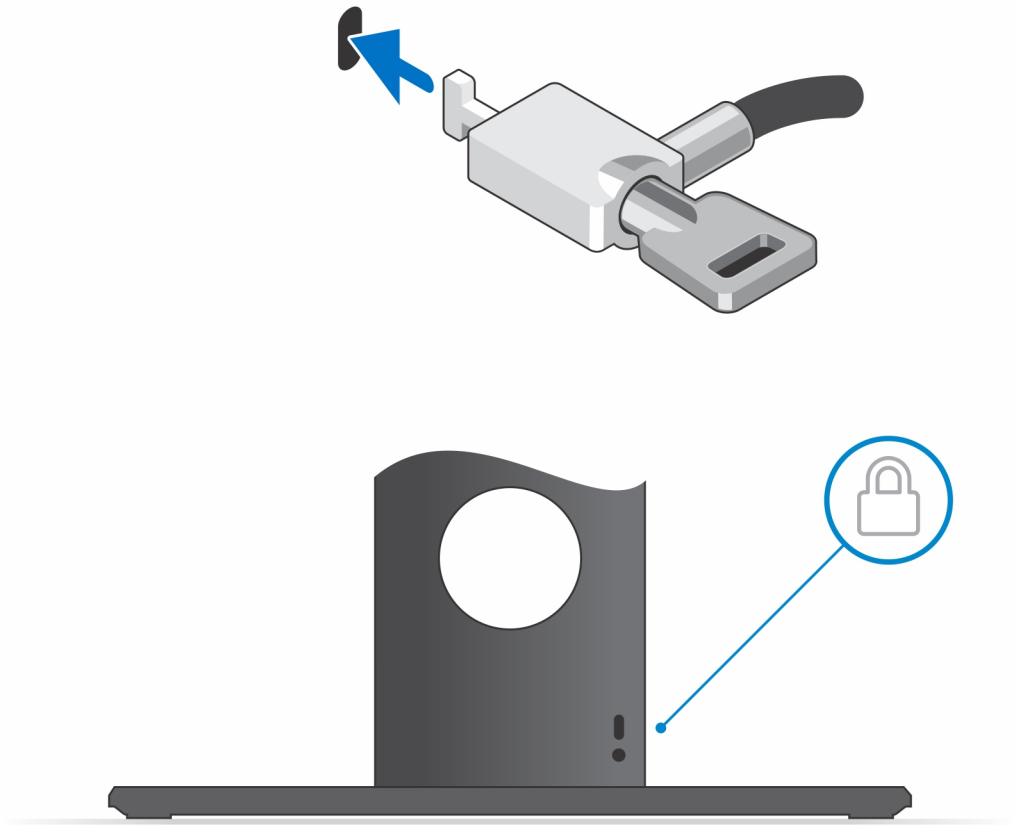
NOTE: All the cables and ports are used depending on the peripherals chosen and the configuration of the computer.



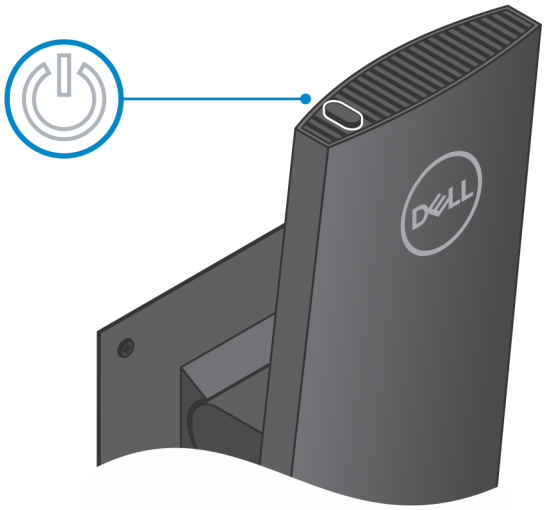
12. Slide the back cover, along with the device, into the stand until you hear a click.



13. Lock the device and the stand cover.



14. Press the power button to turn on the device.



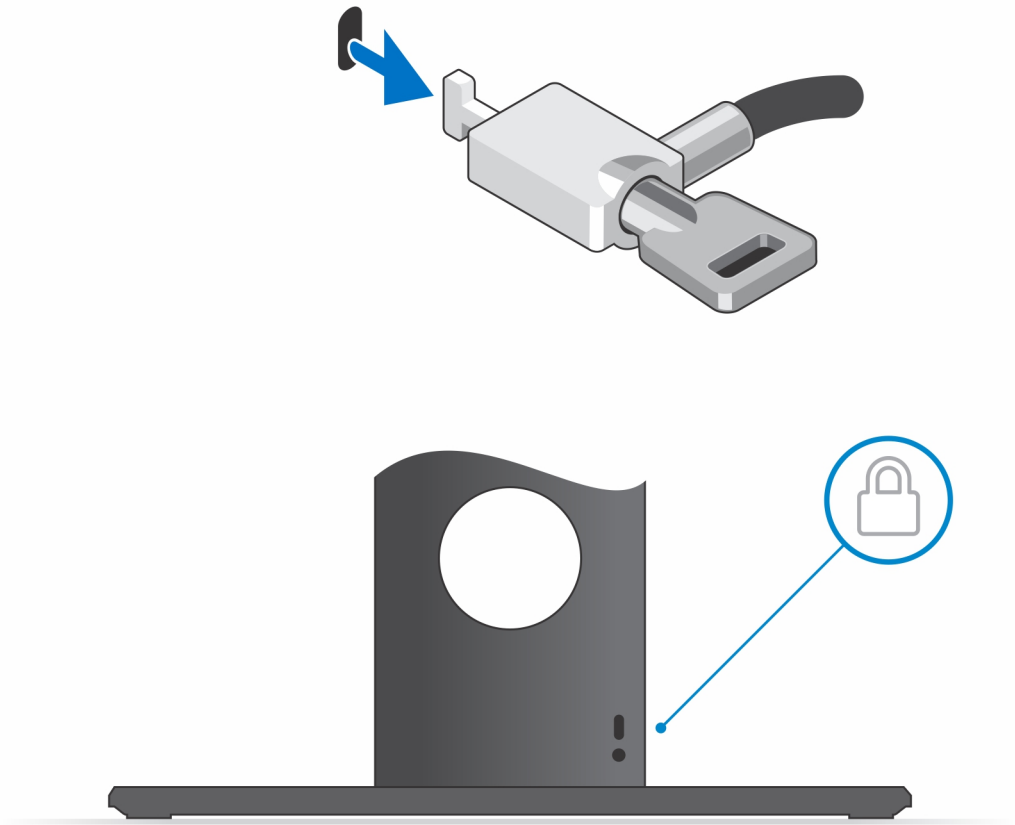
Removing the device from Pro 1 height-adjustable stand

Prerequisites

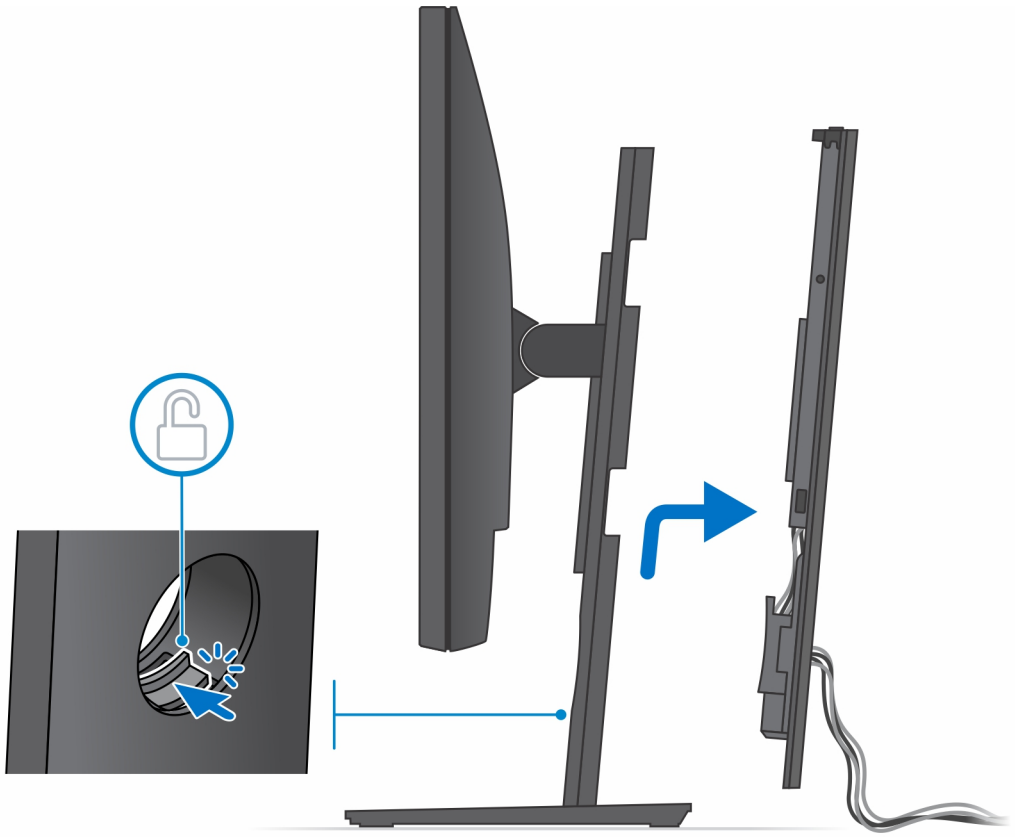
1. Follow the procedure in before working inside your device.

Steps

1. Turn off your device.
2. Unlock the device and the stand cover.

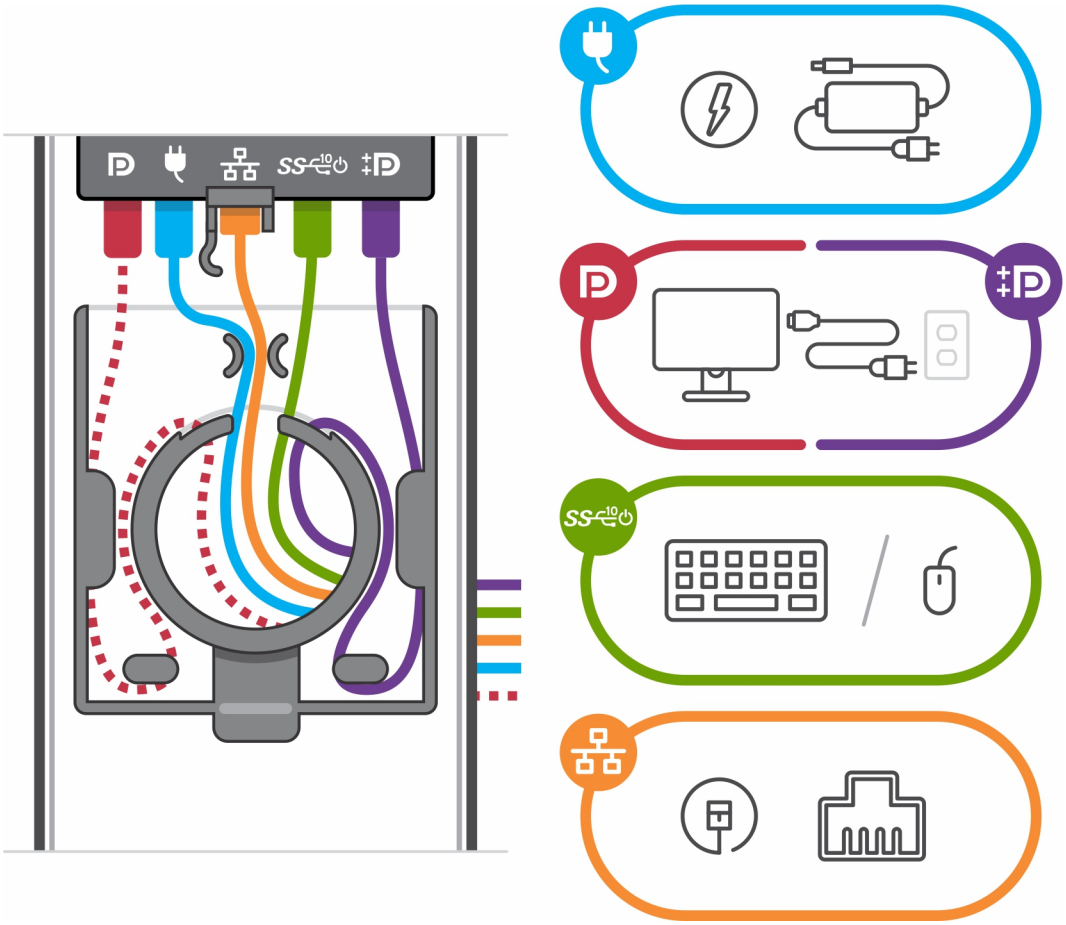


3. Slide the release latch on the stand until you hear a click to release the stand cover.
4. Slide and lift the back cover to release it from the stand.

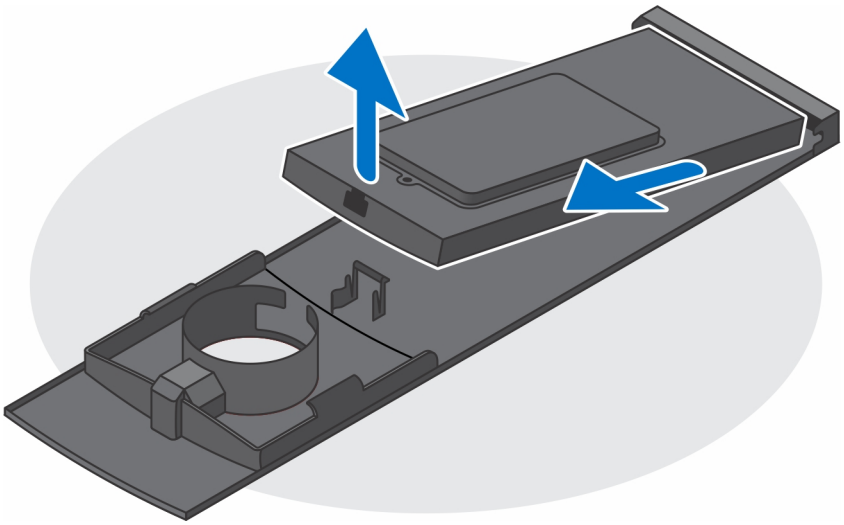


5. Disconnect the keyboard, mouse, network, power, and display cable from the device.

NOTE: All the cables and ports are used depending on the peripherals chosen and the configuration of the computer.



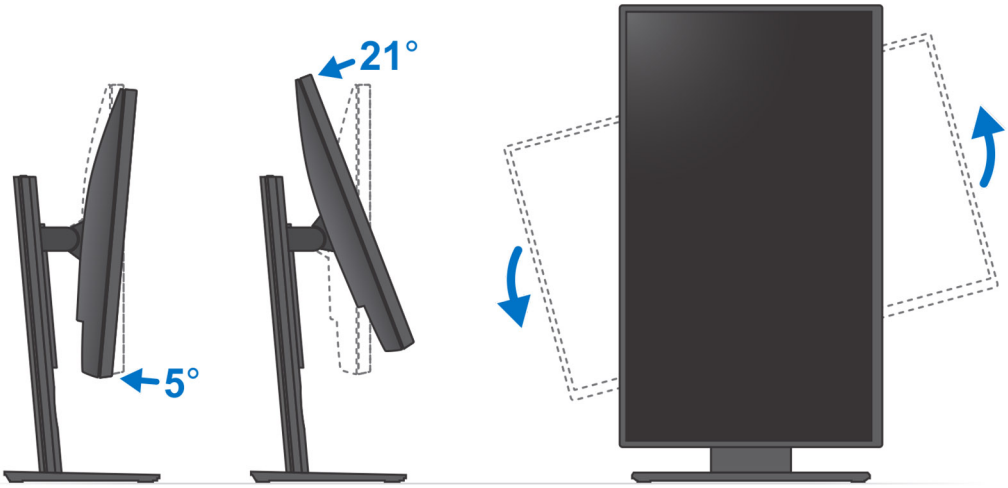
6. Pull the retention latch that secures the device to the stand chassis.
7. Lift the device from the cover.

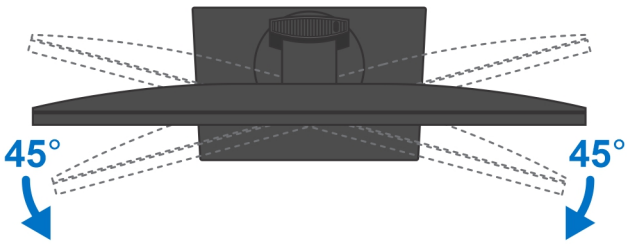


8. Press and hold the power button while the device is unplugged to ground the system board.

NOTE: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface at the same time as touching a connector on the back of the computer.

Stand tilt, pivot, and swivel images



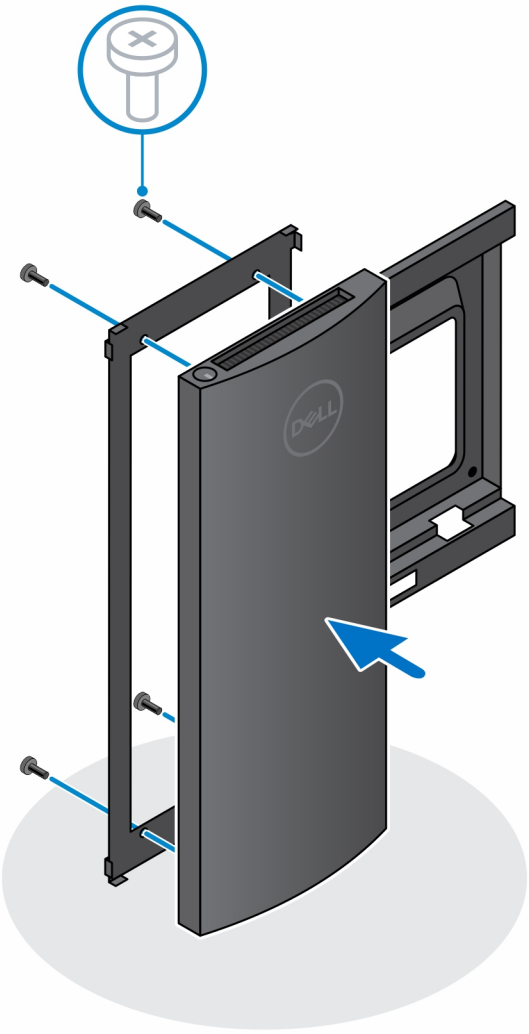


Offset VESA mount

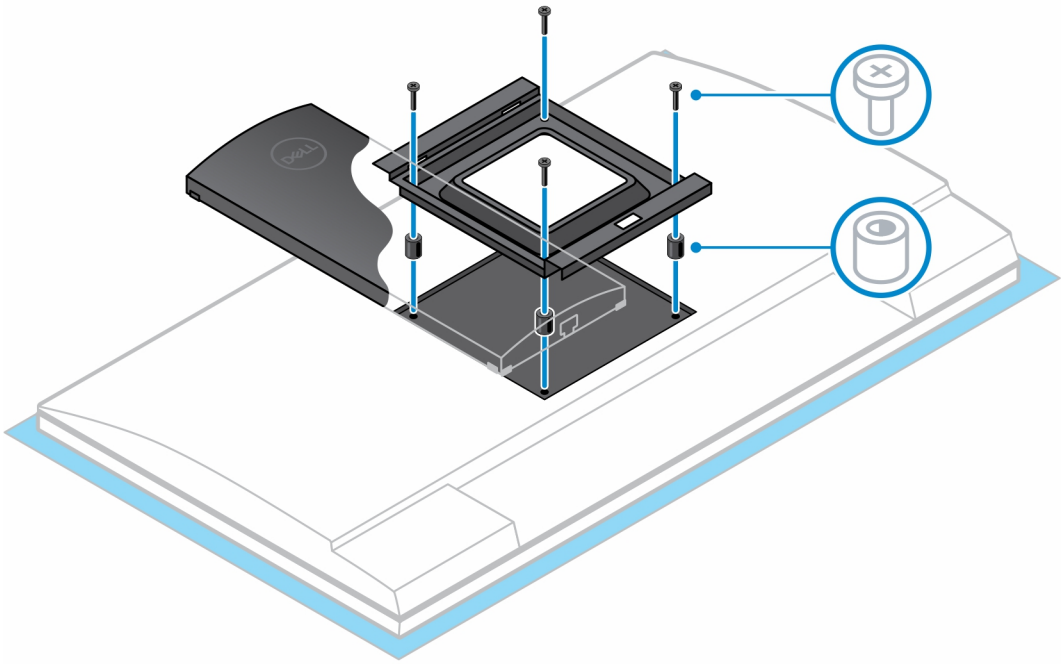
Installing device on offset VESA mount

Steps

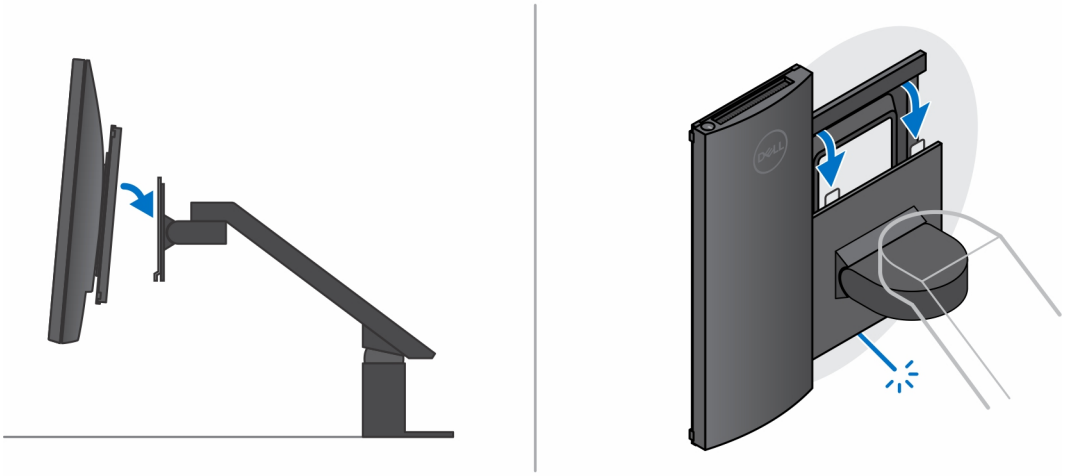
1. Align the screw holes on the device with the screw holes on the offset VESA mount.
2. Install the four screws to secure the device to the offset VESA mount.



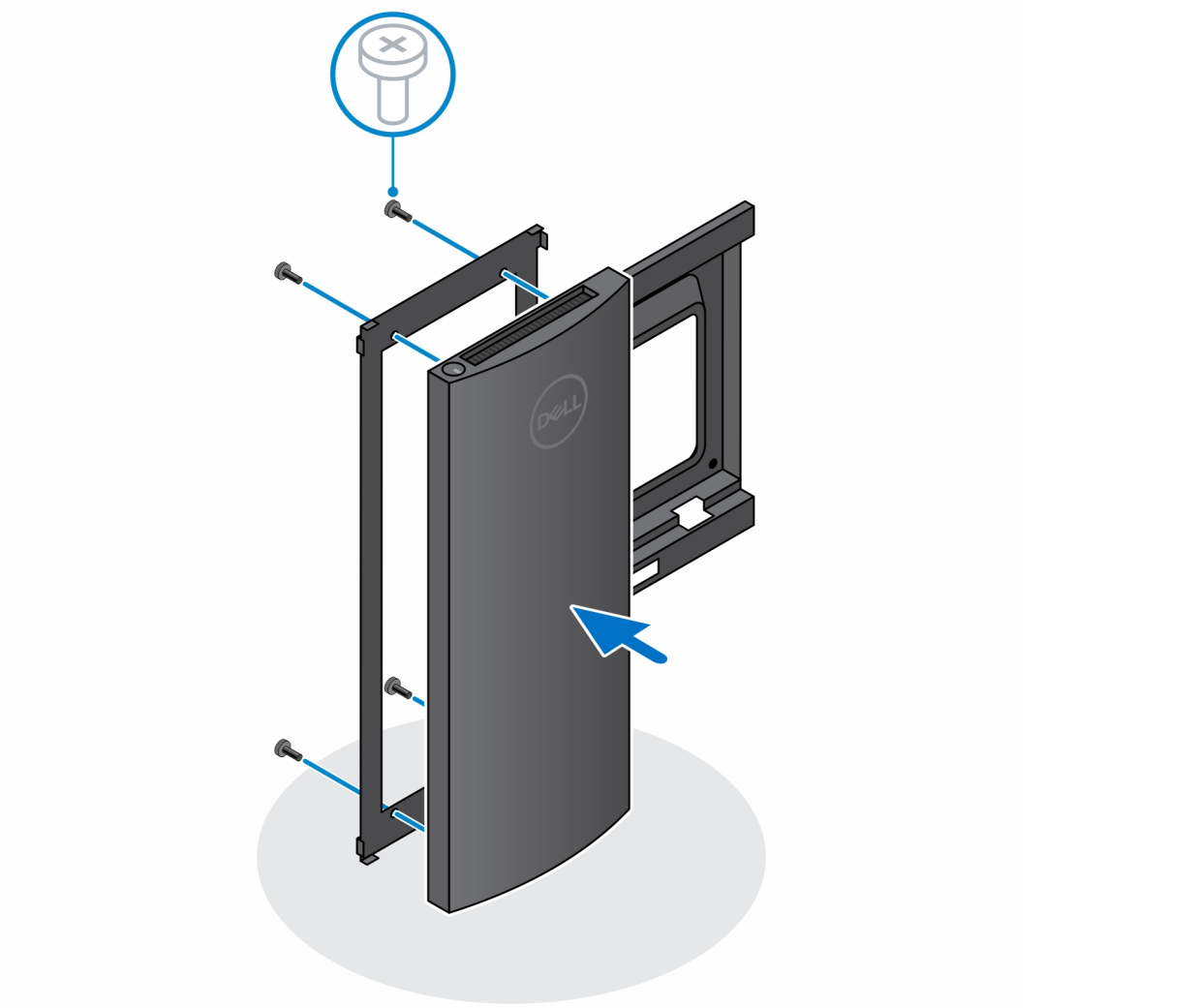
3. To avoid any damage to the monitor, ensure that you place the monitor on a protective sheet.
4. Align the screw holes on the offset VESA mount with the screw holes on the monitor.
5. Install the four screw spacers and the screws to secure the offset VESA mount to the monitor.



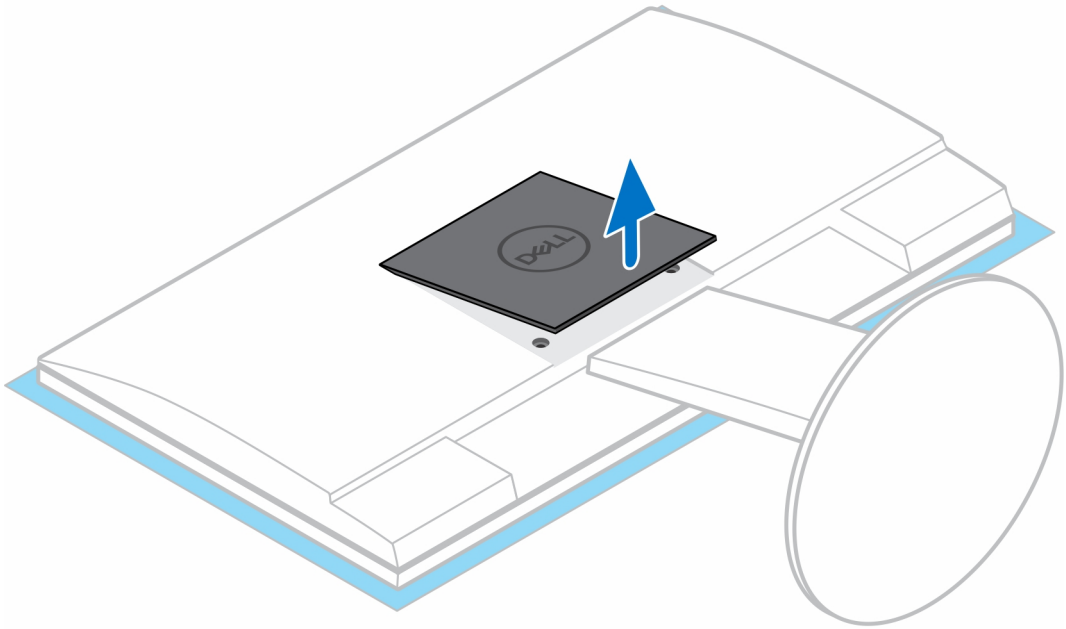
6. Insert the hooks on the mounting bracket of the monitor arm stand into the slots on the offset VESA mount on the monitor.
7. Lower the monitor on the monitor arm stand until you hear a click.

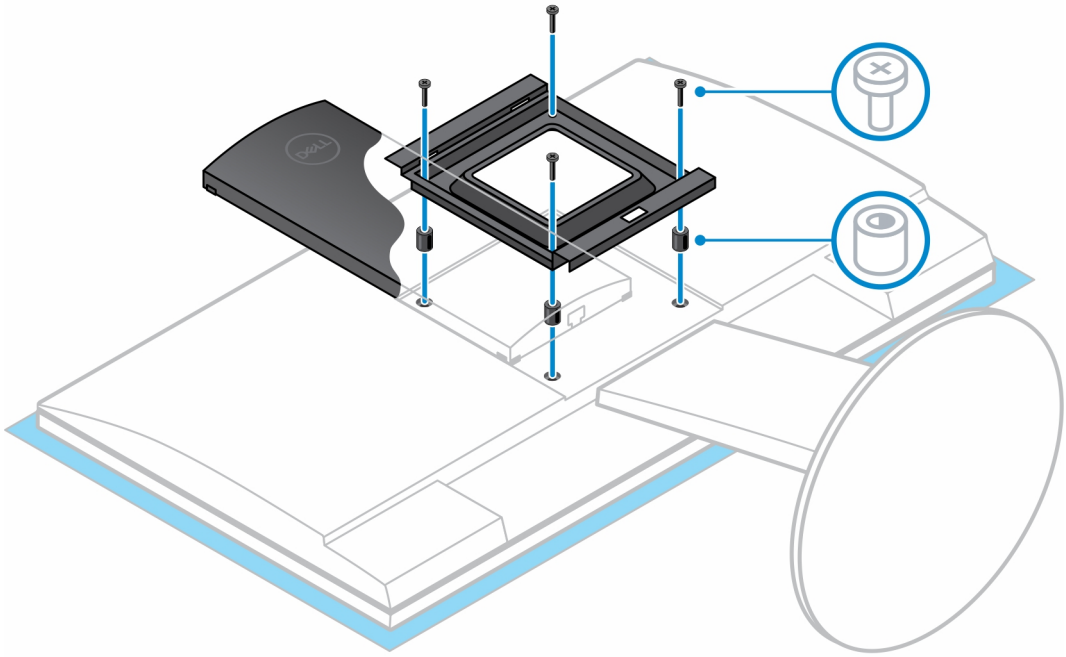


8. To install the offset VESA mount on a Dell E-Series monitor:
   a. Align and install the four screws to secure the device to the offset VESA mount.

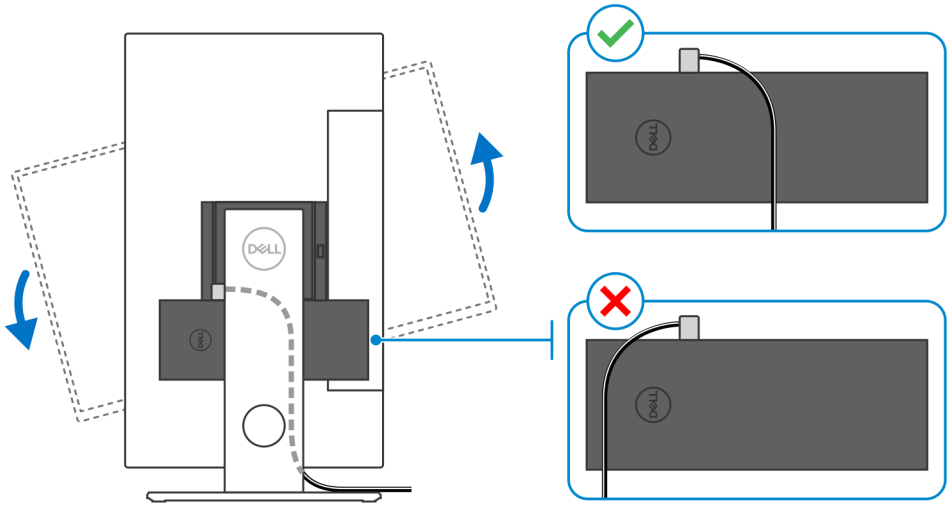


b. Remove the VESA cover from the back of the monitor and secure the offset VESA mount along with the device to the monitor.





NOTE: While orienting the monitor horizontally, route the security lock cable to the right side of the device to avoid any impact to WLAN performance.



Removing the device from offset VESA mount

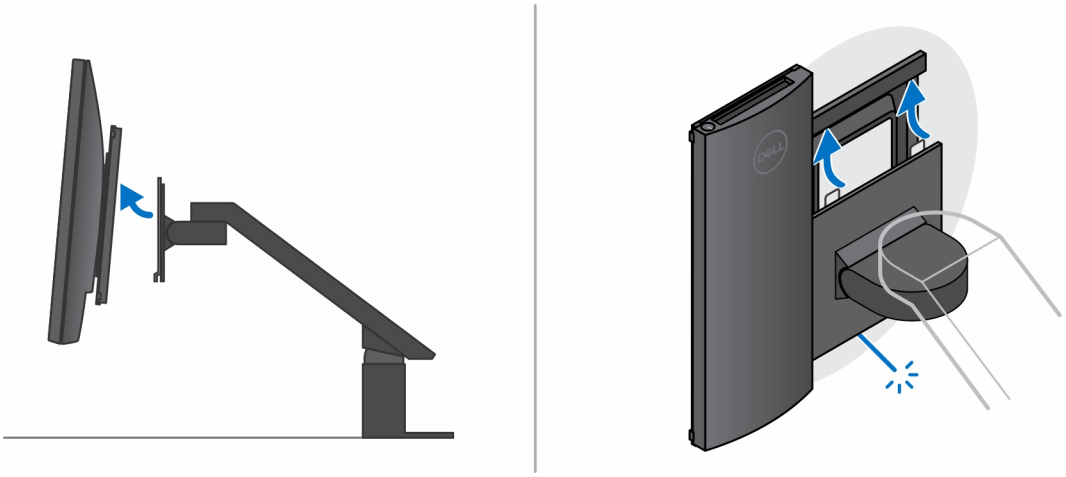
Prerequisites

1. Follow the procedure in before working inside your device.

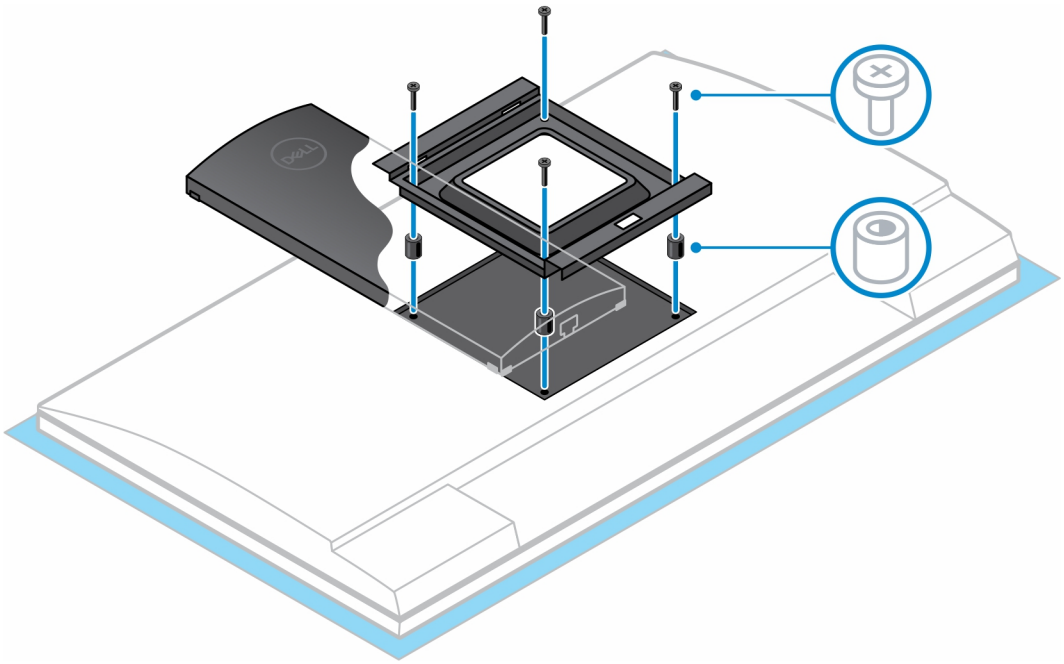
Steps

1. Turn off your device.
2. Disconnect the keyboard, mouse, network, power, and display cable from the device.
3. Push the quick release button on the VESA mount.
4. Slide and remove the monitor arm from the offset VESA mount (U/P-series monitor).

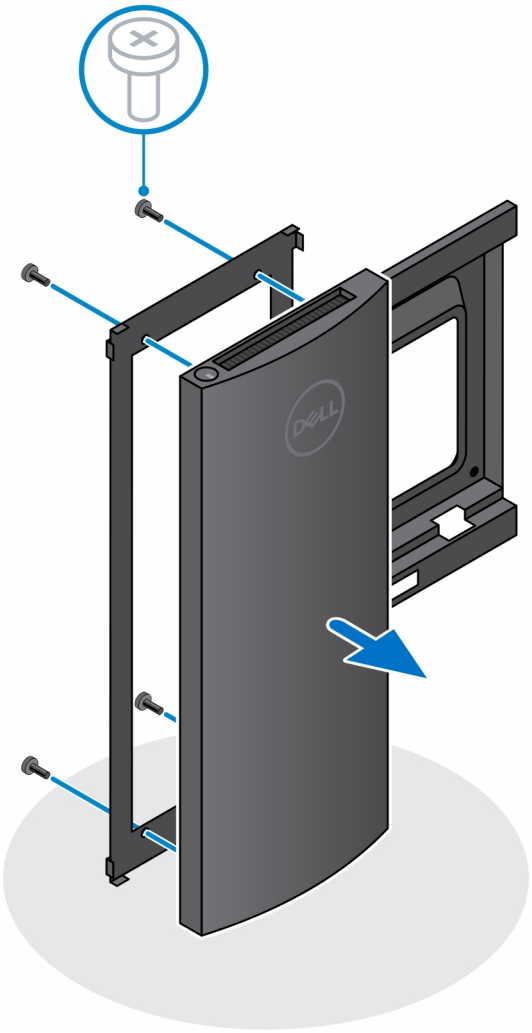
   NOTE: For E-series monitor, remove the VESA cover.



5. Remove the four screws that secure the offset VESA mount to the monitor.
6. Remove the four holders on which the offset VESA mount is mounted.



7. Lift the offset VESA mount from the monitor.
8. Remove the four screws that secure the device to the offset VESA mount.
9. Lift the device away from the offset VESA mount.



10. Press and hold the power button while the device is unplugged to ground the system board.

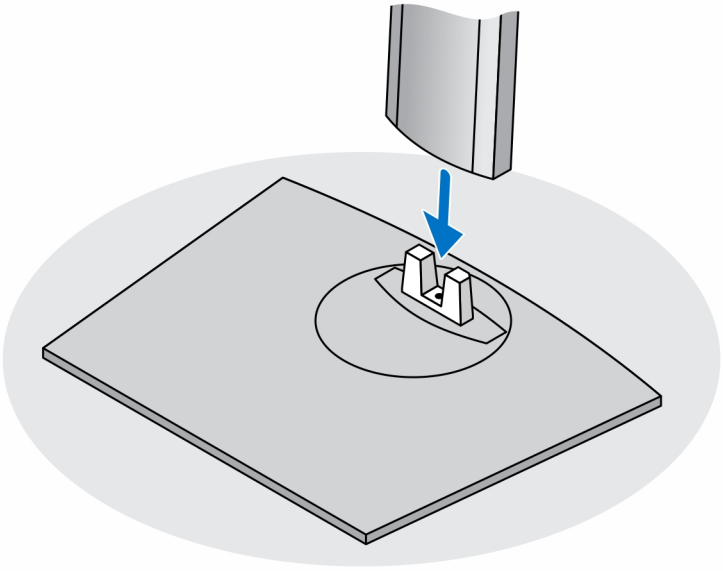
NOTE: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface at the same time as touching a connector on the back of the computer.

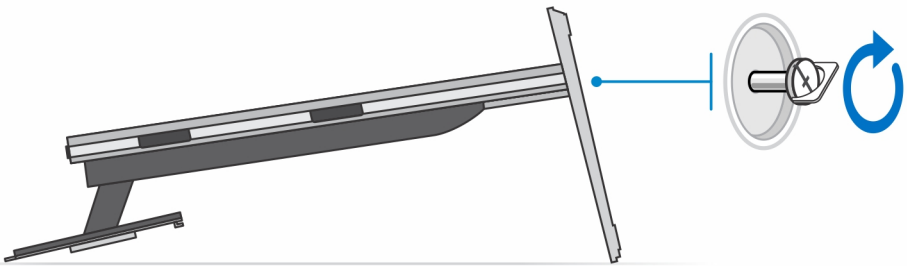
Pro 2 Height-adjustable stand-HAS

Installing the device on a Pro 2 height-adjustable stand

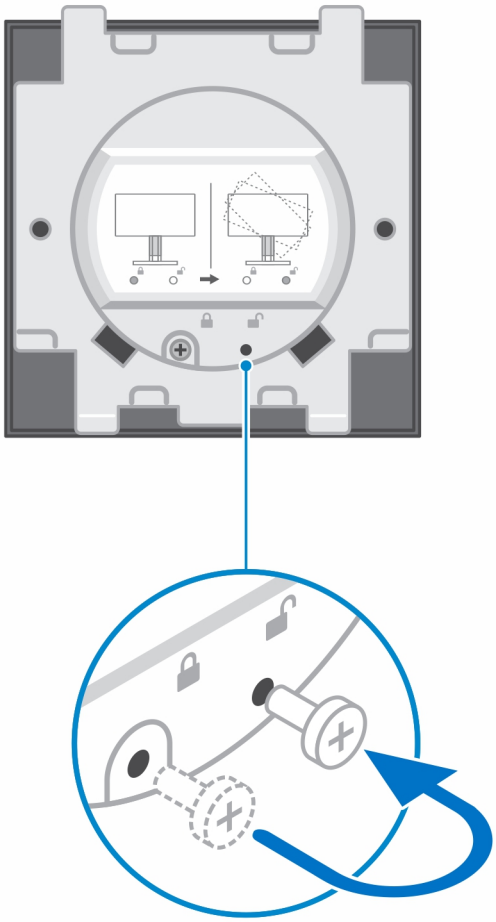
Steps

1. Align and insert the slots on the height-adjustable stand into the tab on the stand base.
2. Lift and tilt the stand base.
3. Tighten the captive screw to secure the stand to the base.

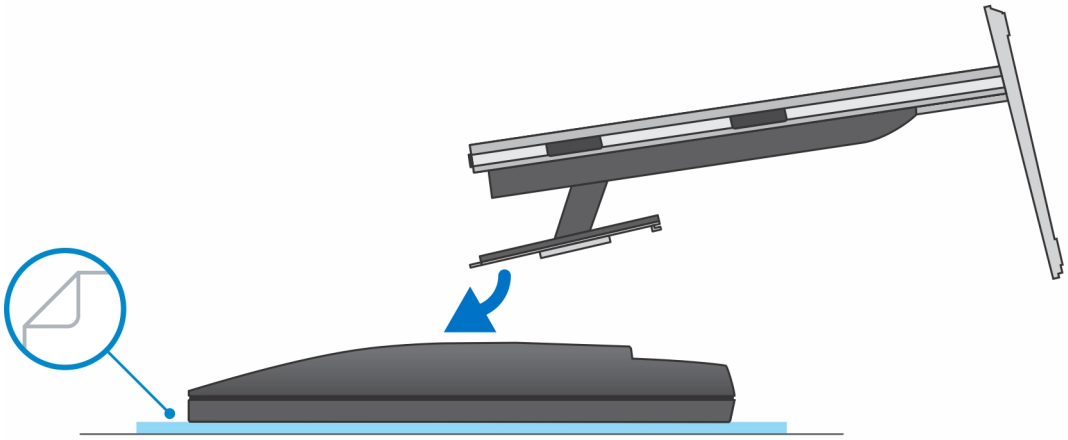


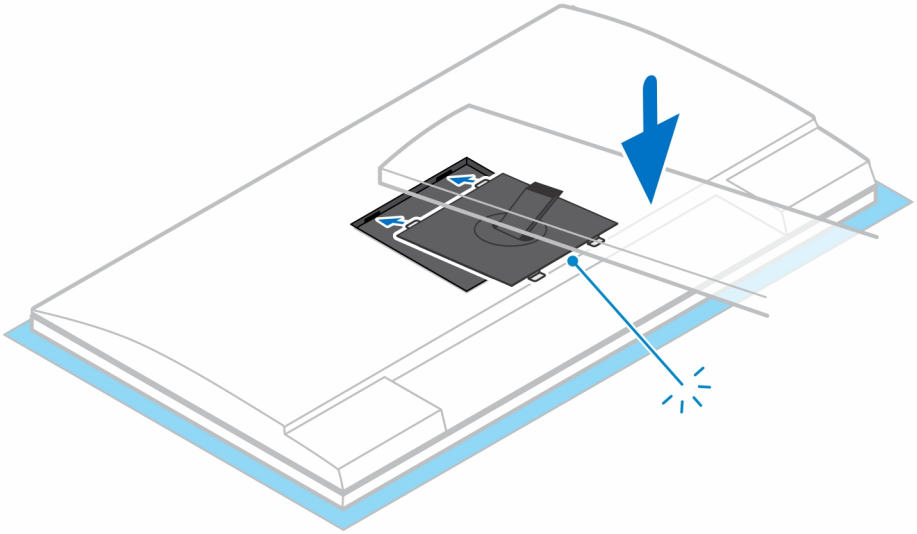


NOTE: For the large height adjustable stand, replacing the screw to the unlock icon screw hole in the stand base ensures the rotation of the 30-inch - 32-inch monitor.

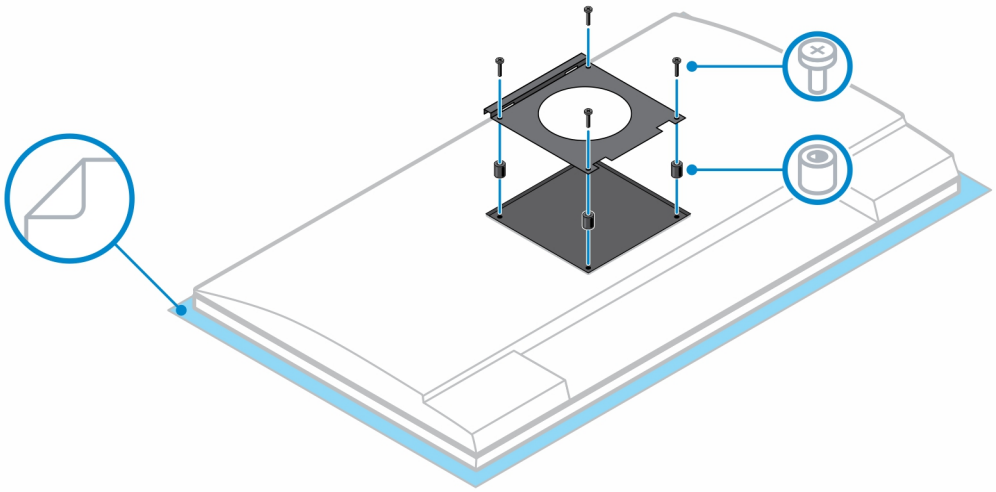


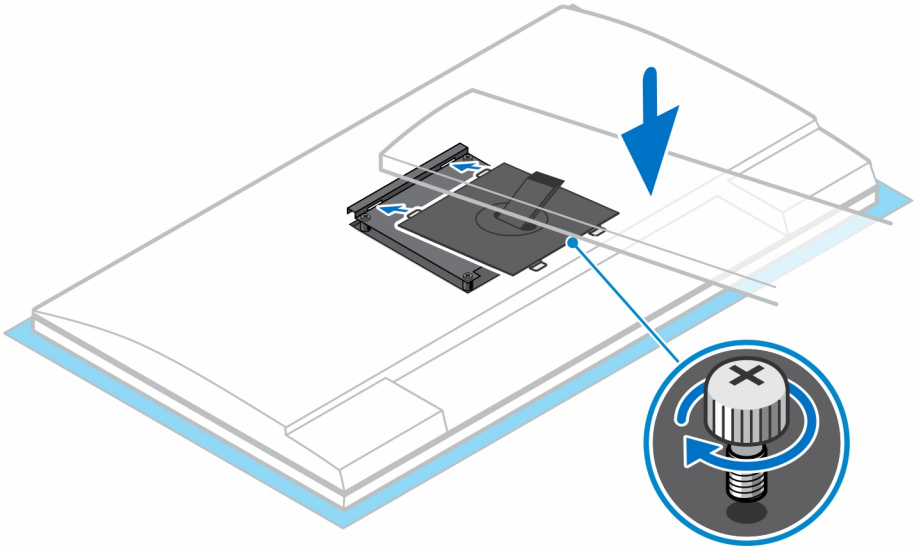
4. To avoid any damage to the monitor, ensure that you place the monitor on a protective sheet.
5. For installing the height-adjustable stand to the monitor:
   a. Align and insert the hooks on the mounting bracket on the stand into the slots on the monitor, until you hear a click.



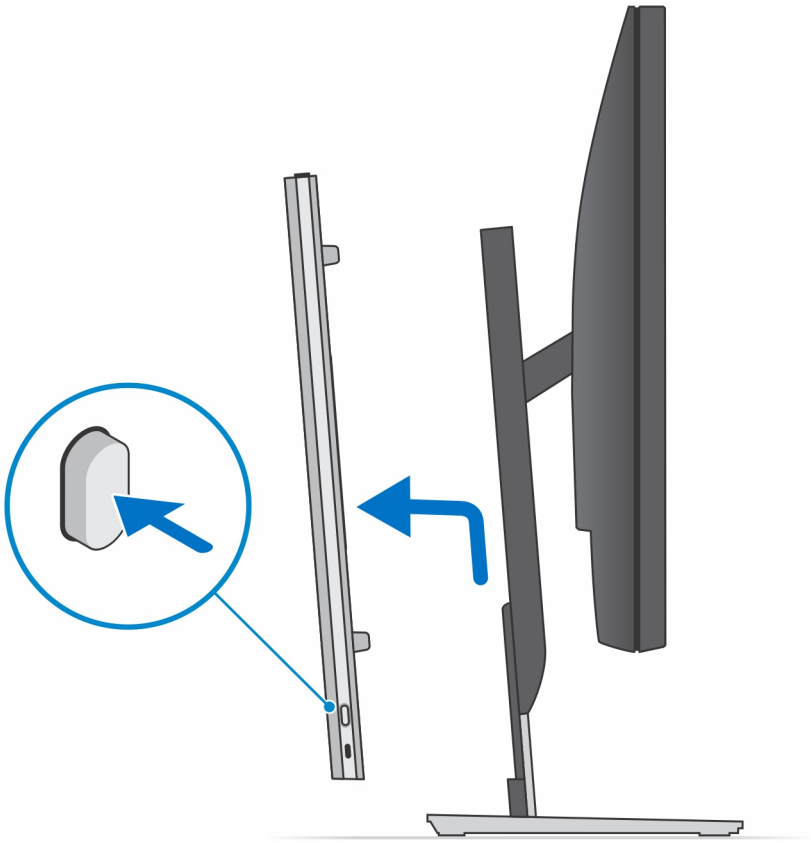


6. For installing QR to VESA bracket for E-Series monitor or monitor without Quick Release support:
   a. Align the screw holes on the QR to VESA bracket with the screw holes on the monitor.
   b. Install the four screw spacers and the screws to secure the QR to VESA bracket to the monitor.
   c. Align and insert the QR tabs on the stand into the slots on the QR to VESA bracket on the monitor.
   d. Tighten the thumb screw to secure the stand to the QR to VESA bracket.

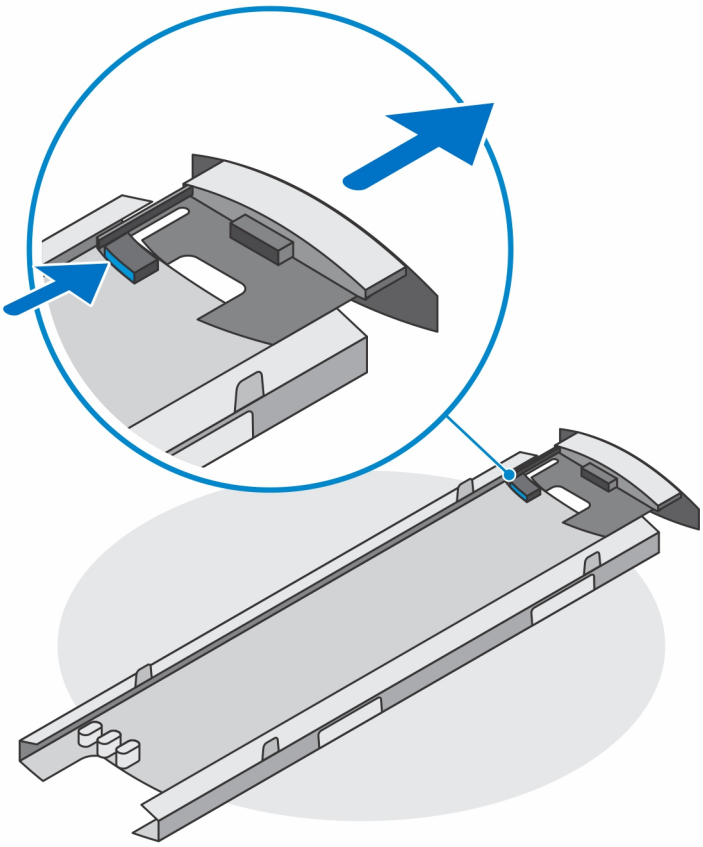




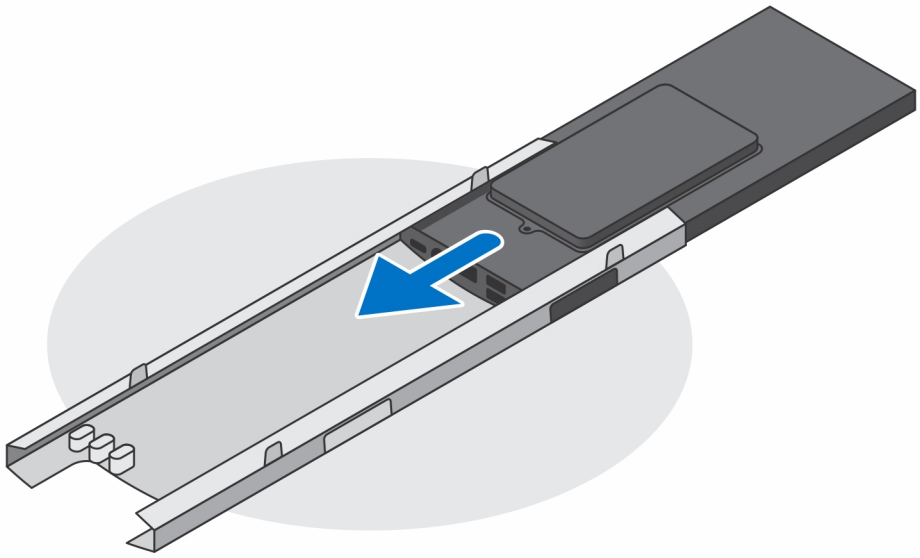
7. To release the stand cover, press the button on the side of the stand chassis.
8. Slide and lift the cover to release it from the stand.



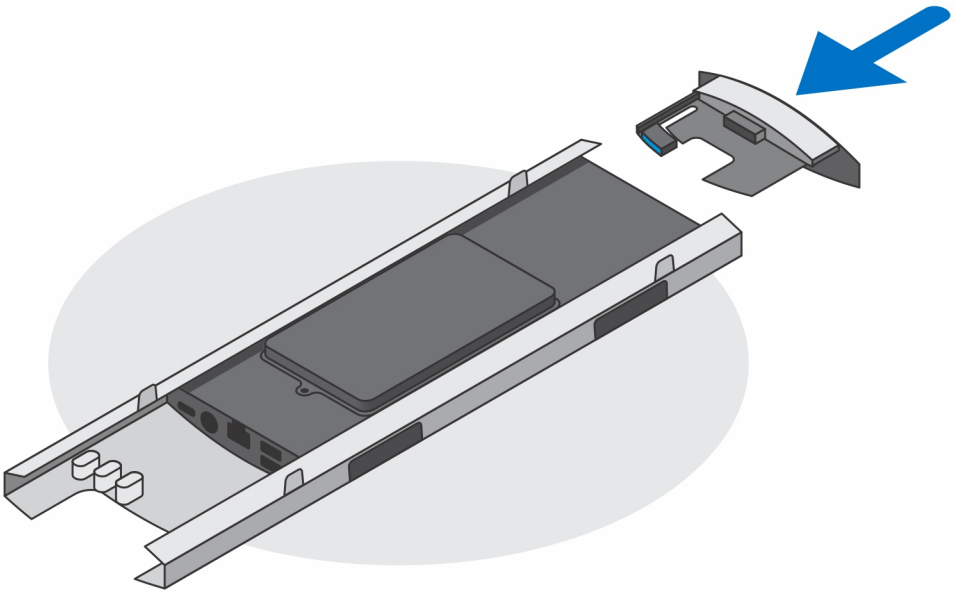
9. Slide and release the inner bar on the lower edge of the stand cover.



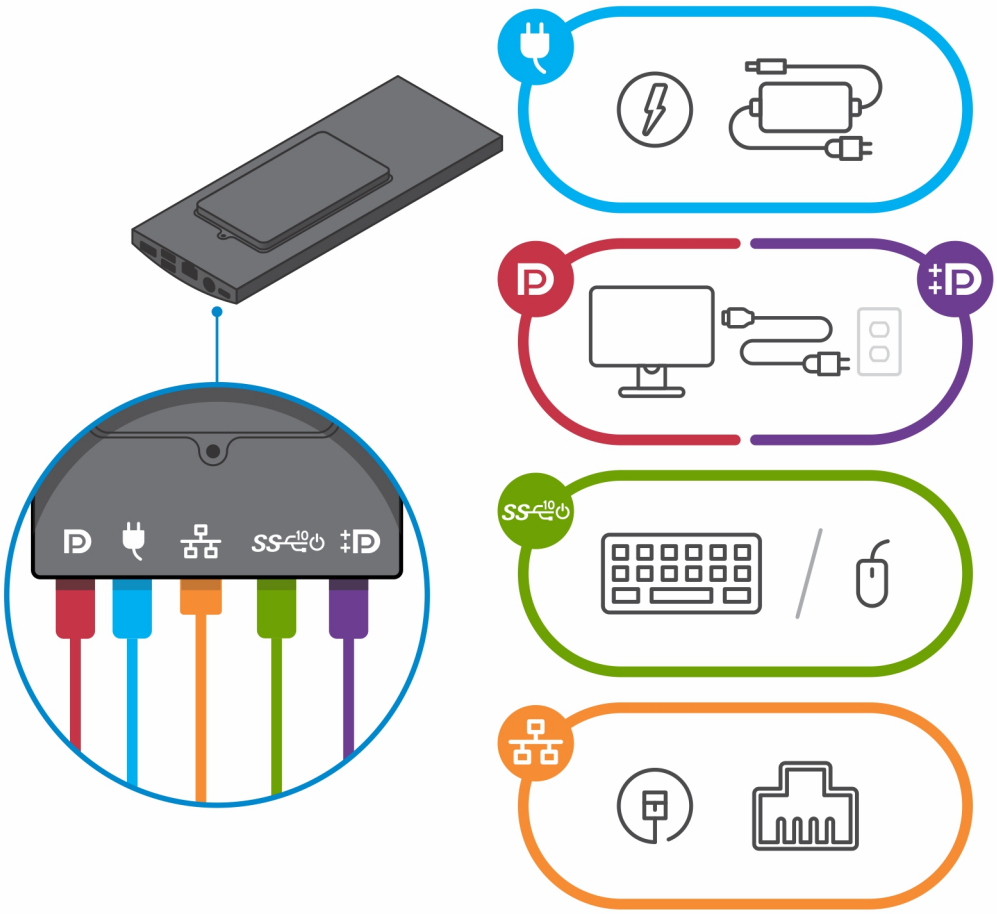
10. Align the vents on the device with the vents on the stand cover and slide the device in the cover.



11. Slide the inner bar back to the lower edge of the stand cover to lock the device to the cover.



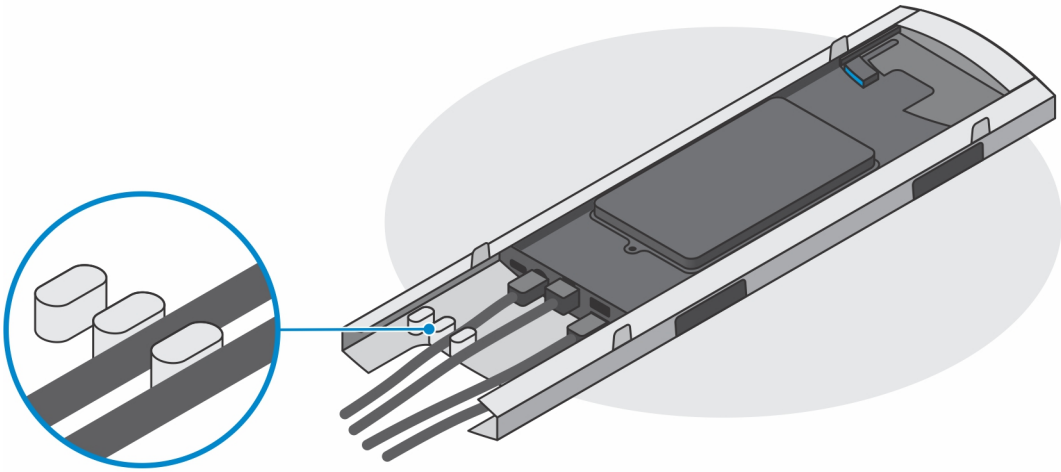
12. Connect the power, network, keyboard, mouse, and display cables to the device and to the power outlet.



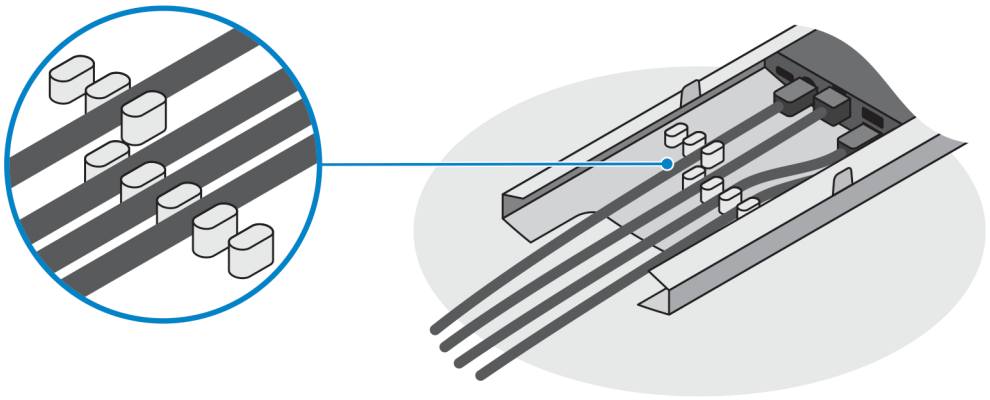
13. To avoid any pinching or crimping of the cables while closing the stand cover, it is recommended that you route the cables as indicated in the image.

NOTE: All the cables and ports are used depending on the peripherals chosen and the configuration of the computer.

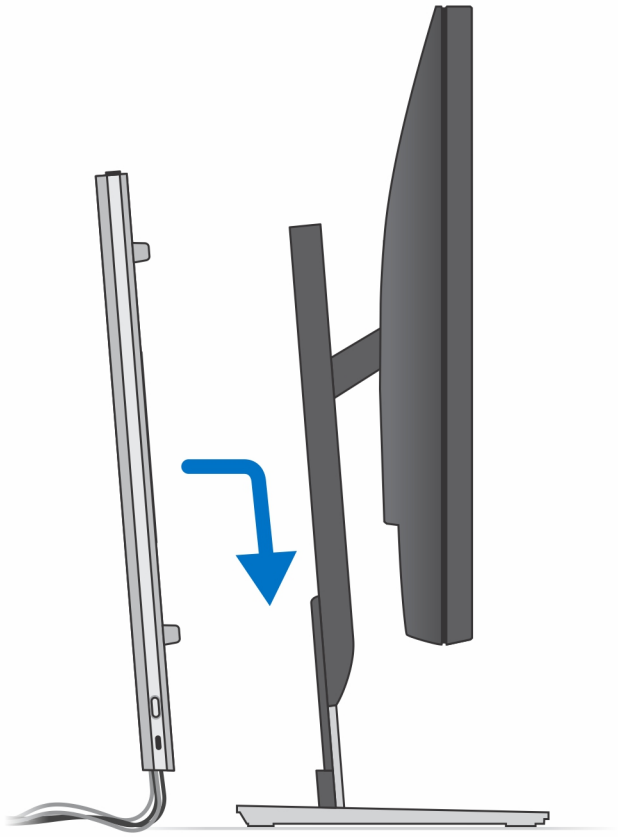
Standard Height Adjustable Stand



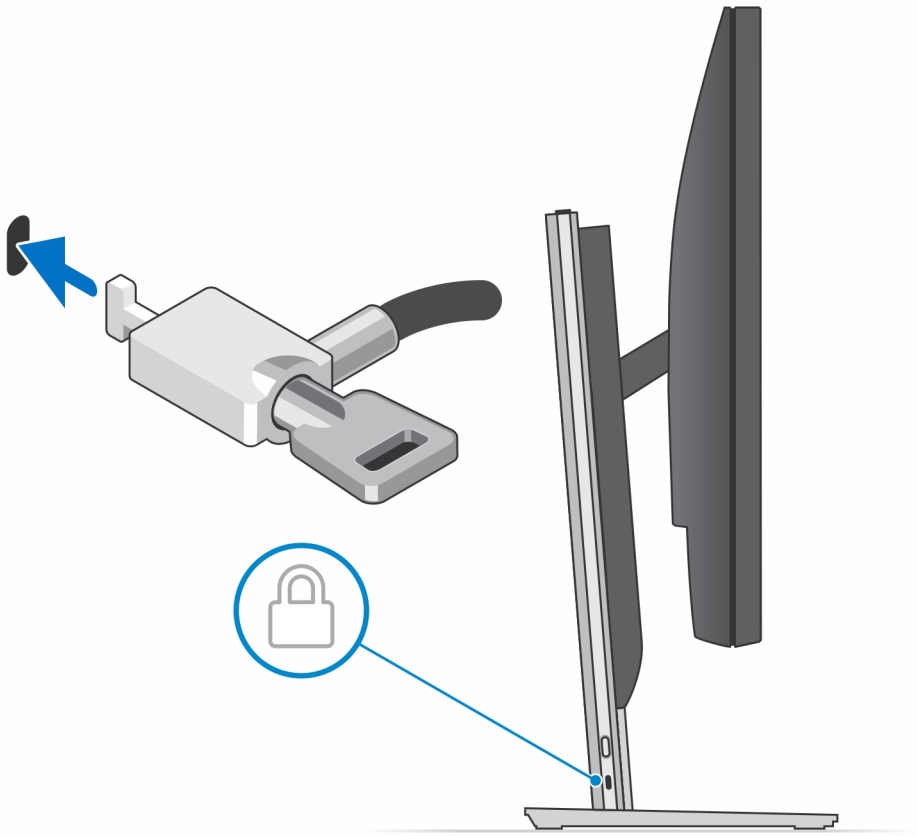
Large Height Adjustable Stand



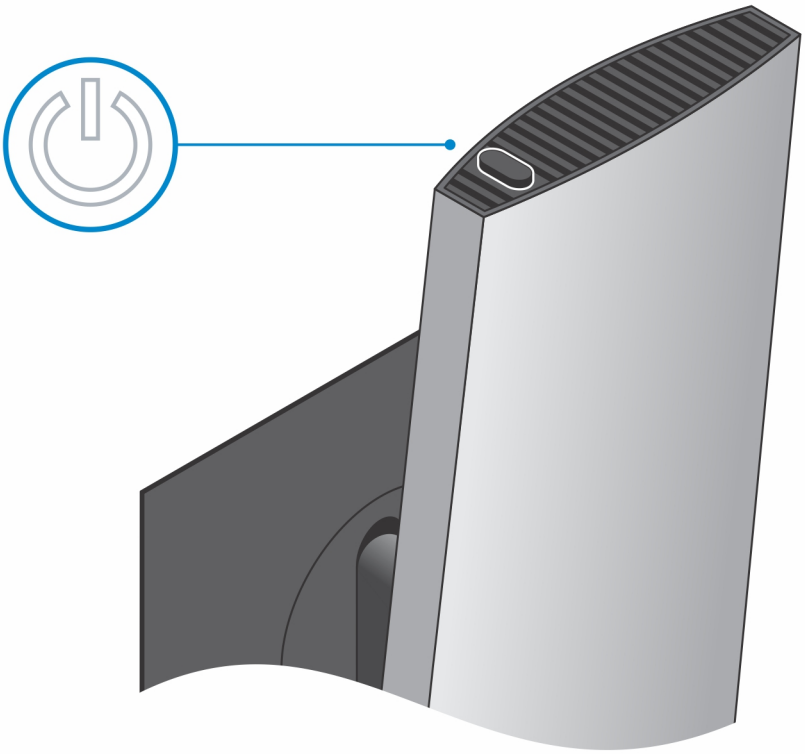
14. Slide the stand cover, along with the device, into the stand until you hear a click.



15. Lock the device and the stand cover.



16. Press the power button to turn on the device.



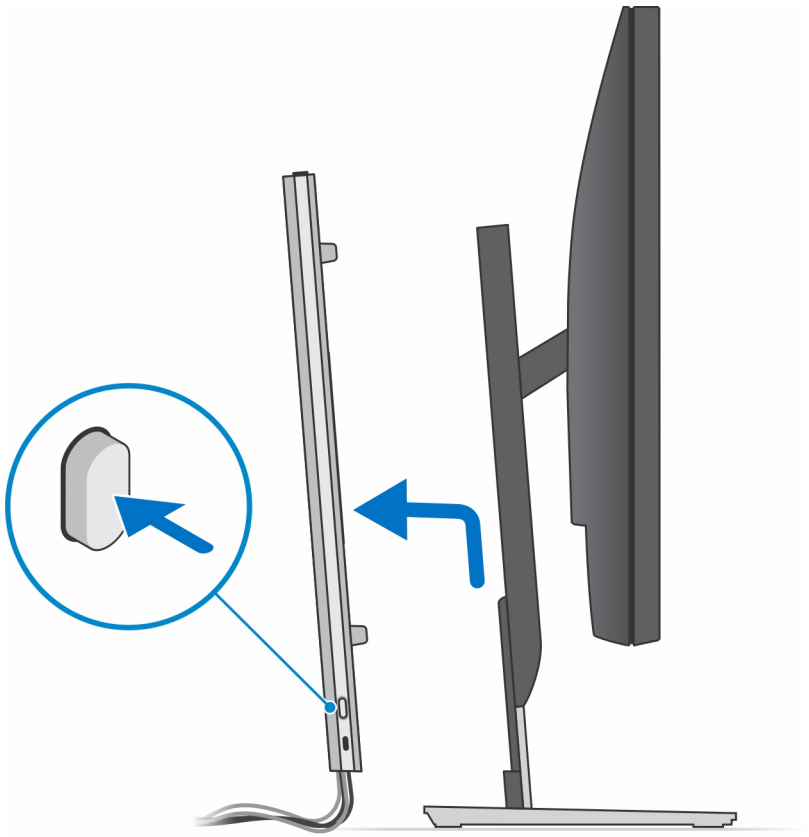
Removing the device from a Pro 2 height-adjustable stand

Prerequisites

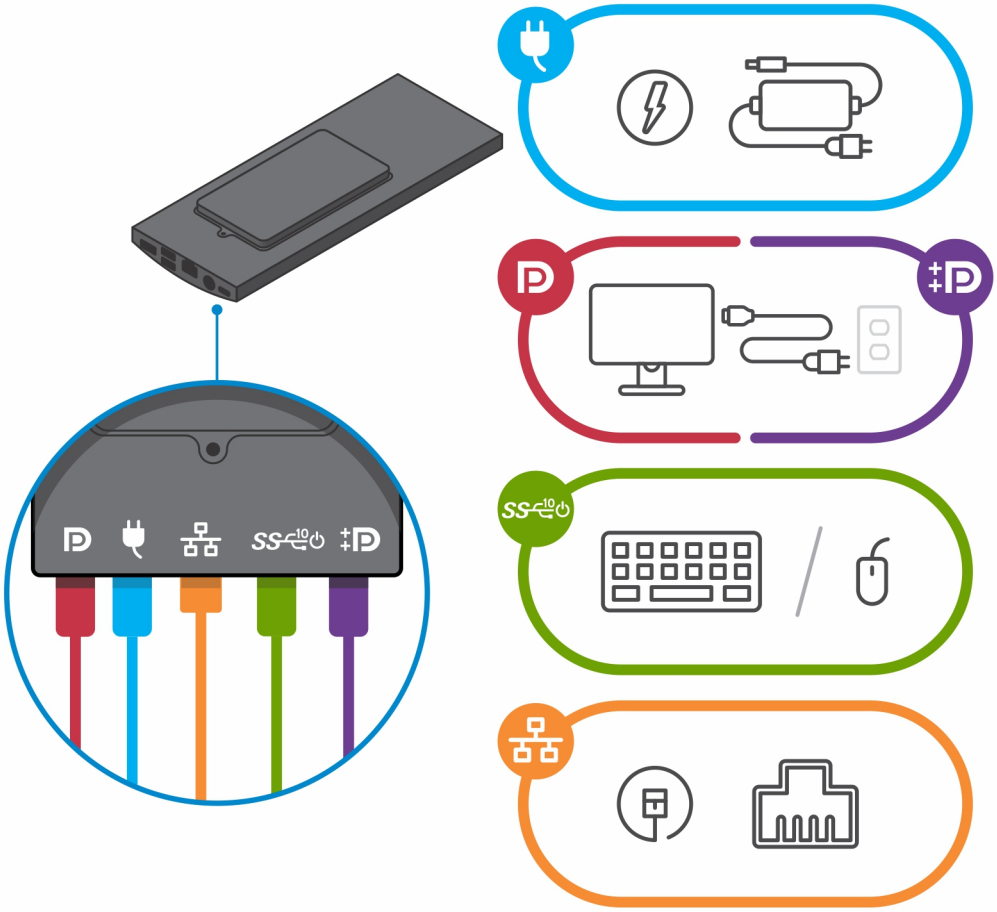
1. Follow the procedure in before working inside your device.

Steps

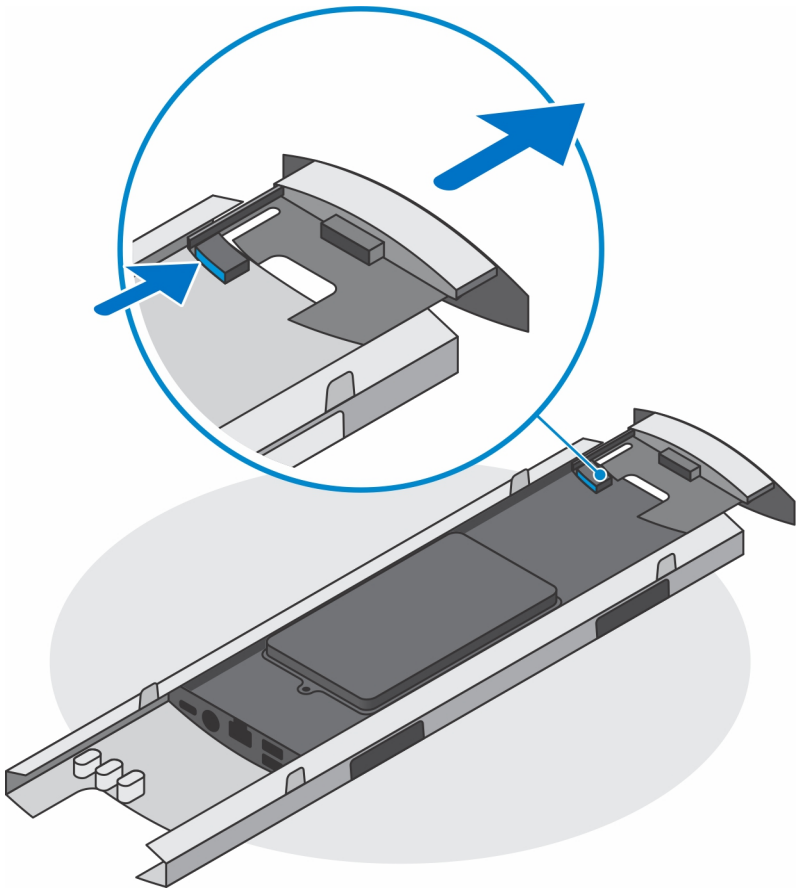
1. Turn off your device.
2. Press the button on the side of the stand chassis, to release the stand cover.
3. Slide and lift the back cover to release it from the stand.



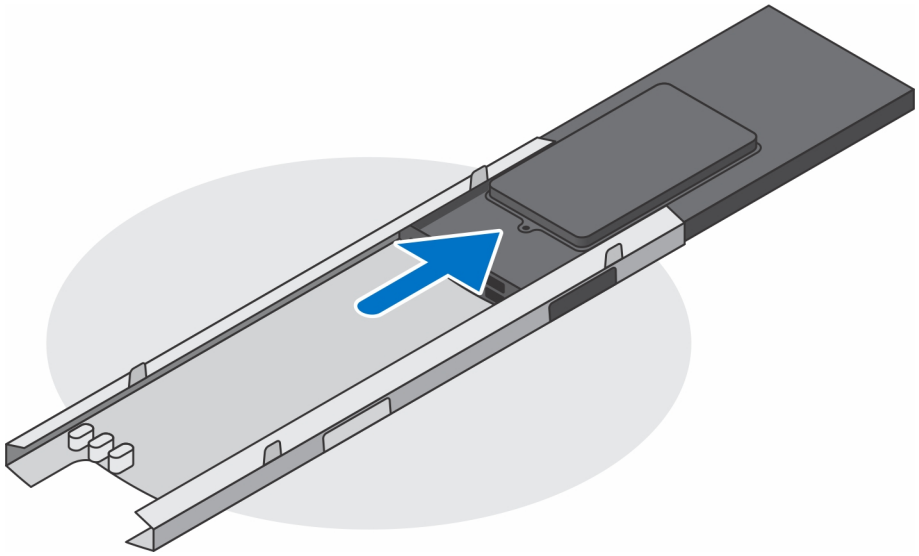
4. Disconnect the keyboard, mouse, network, power, and display cable from the device.



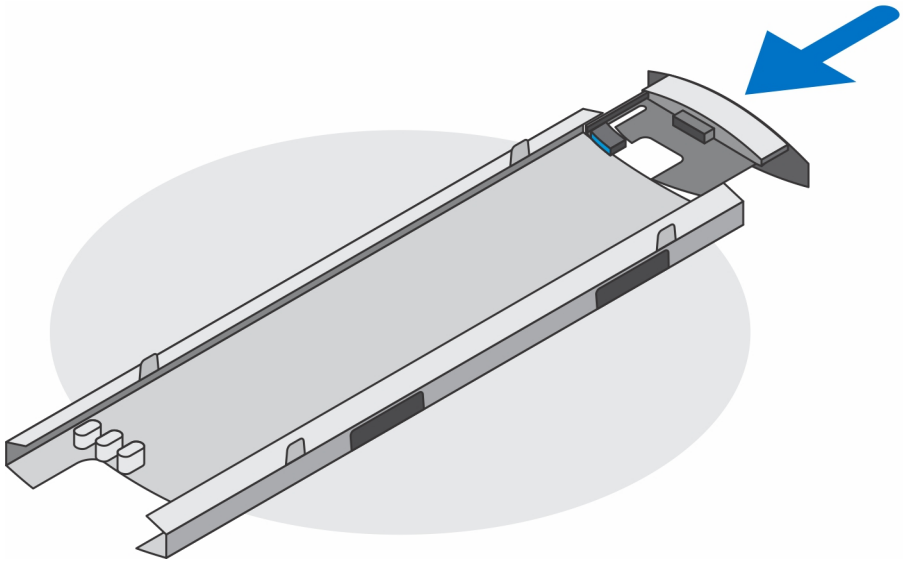
5. Slide and release the inner bar on the lower edge of the stand cover that secures the device to the stand chassis.



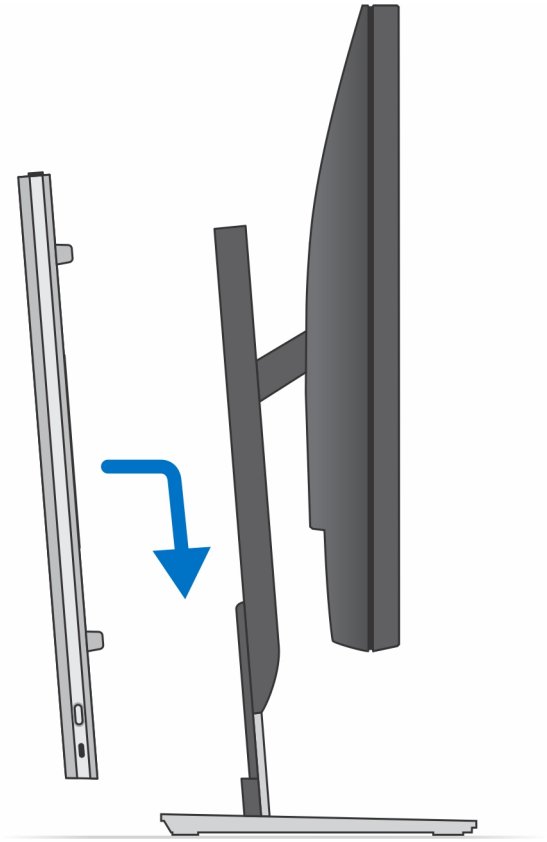
6. Slide and remove the device from the cover.



7. Slide the inner bar back to the lower edge of the stand cover.



8. Slide the stand cover back to the stand.

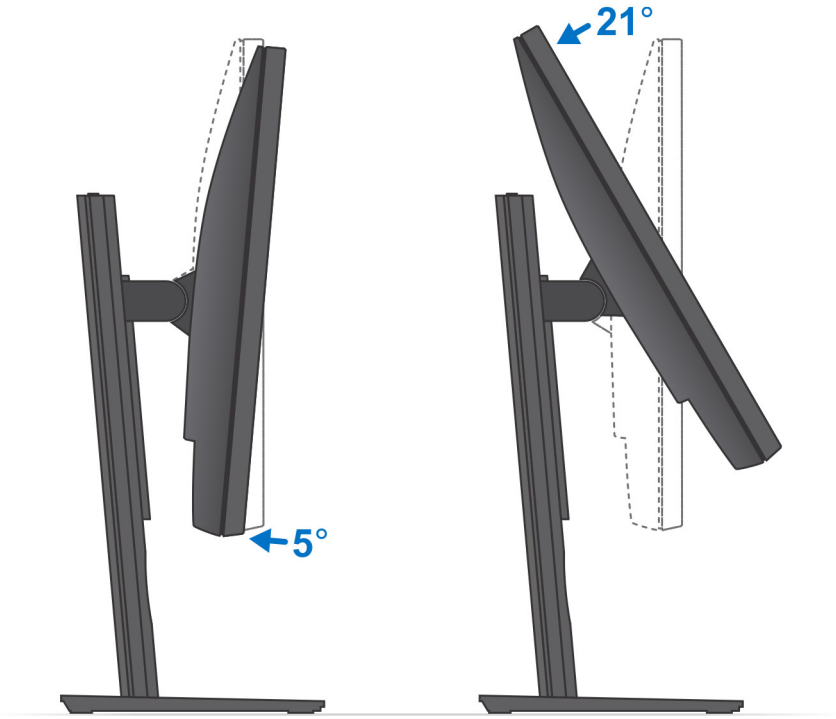


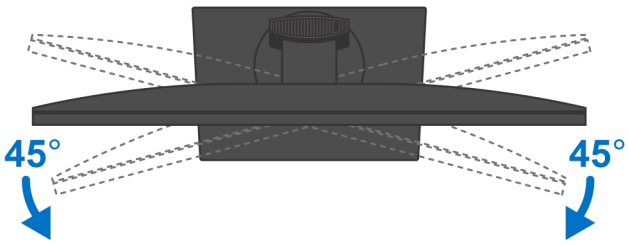
9. Press and hold the power button while the device is unplugged to ground the system board.

NOTE: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface at the same time as touching a connector on the back of the computer.

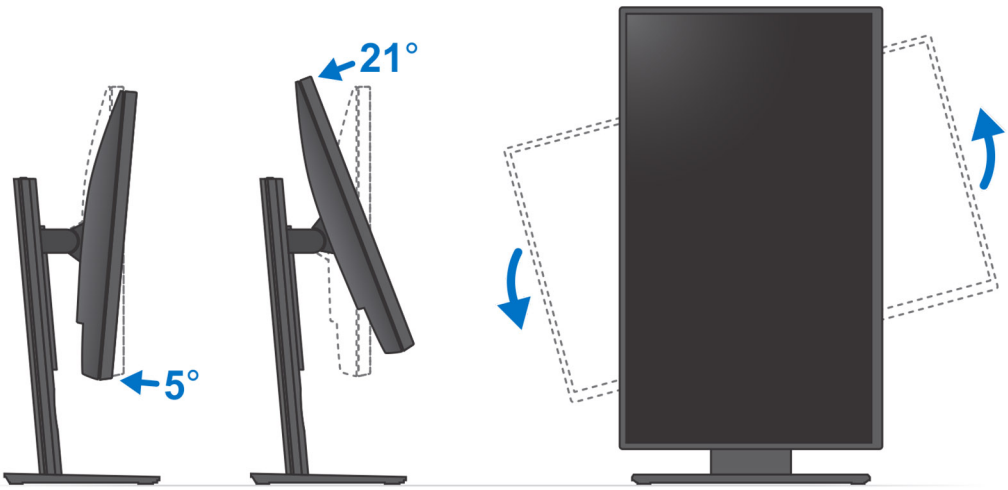
Stand tilt, pivot, and swivel images

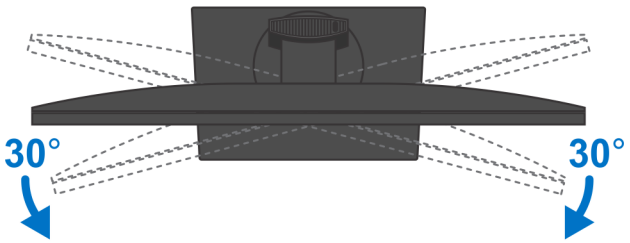
For 19-inch to 27-inch monitor (Standard height adjustable stand):



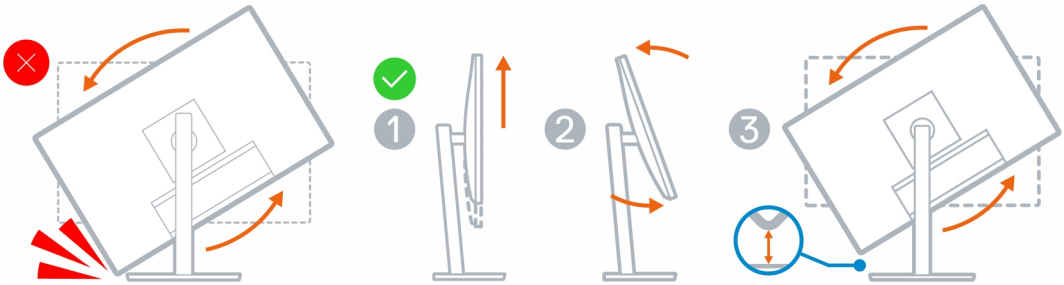


For 30-inch to 32-inch monitor (Large height adjustable stand):





For monitors > 32-inch (Large height adjustable stand):

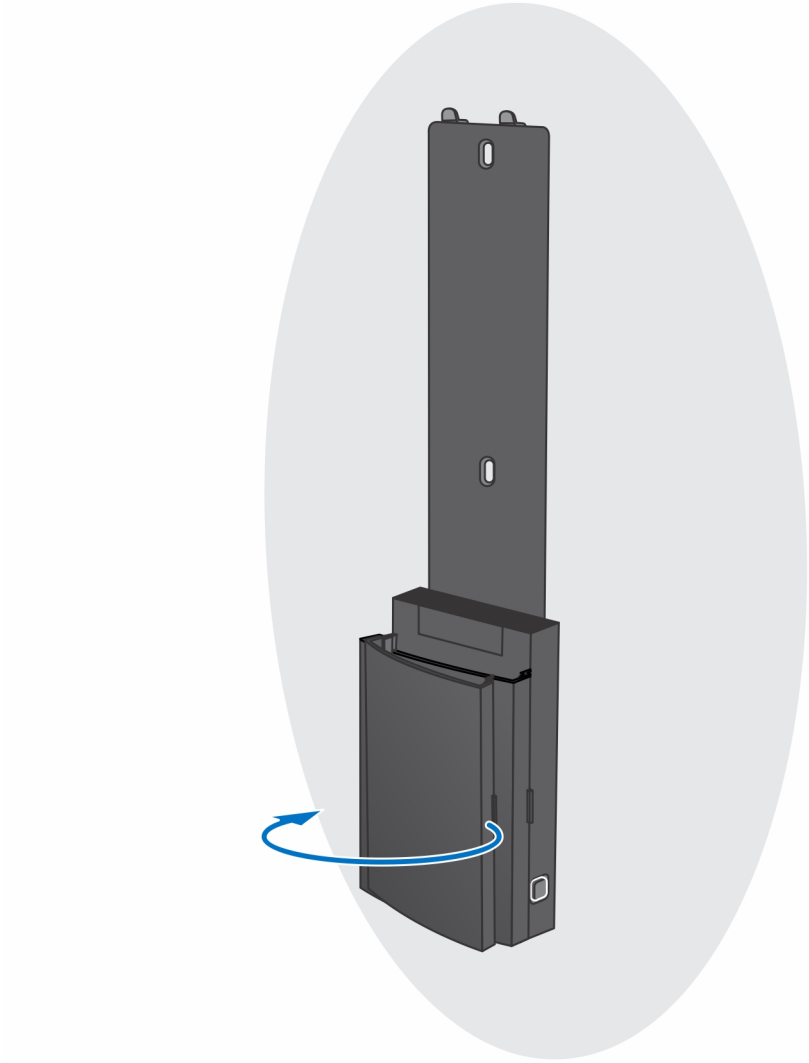


Wall Mount

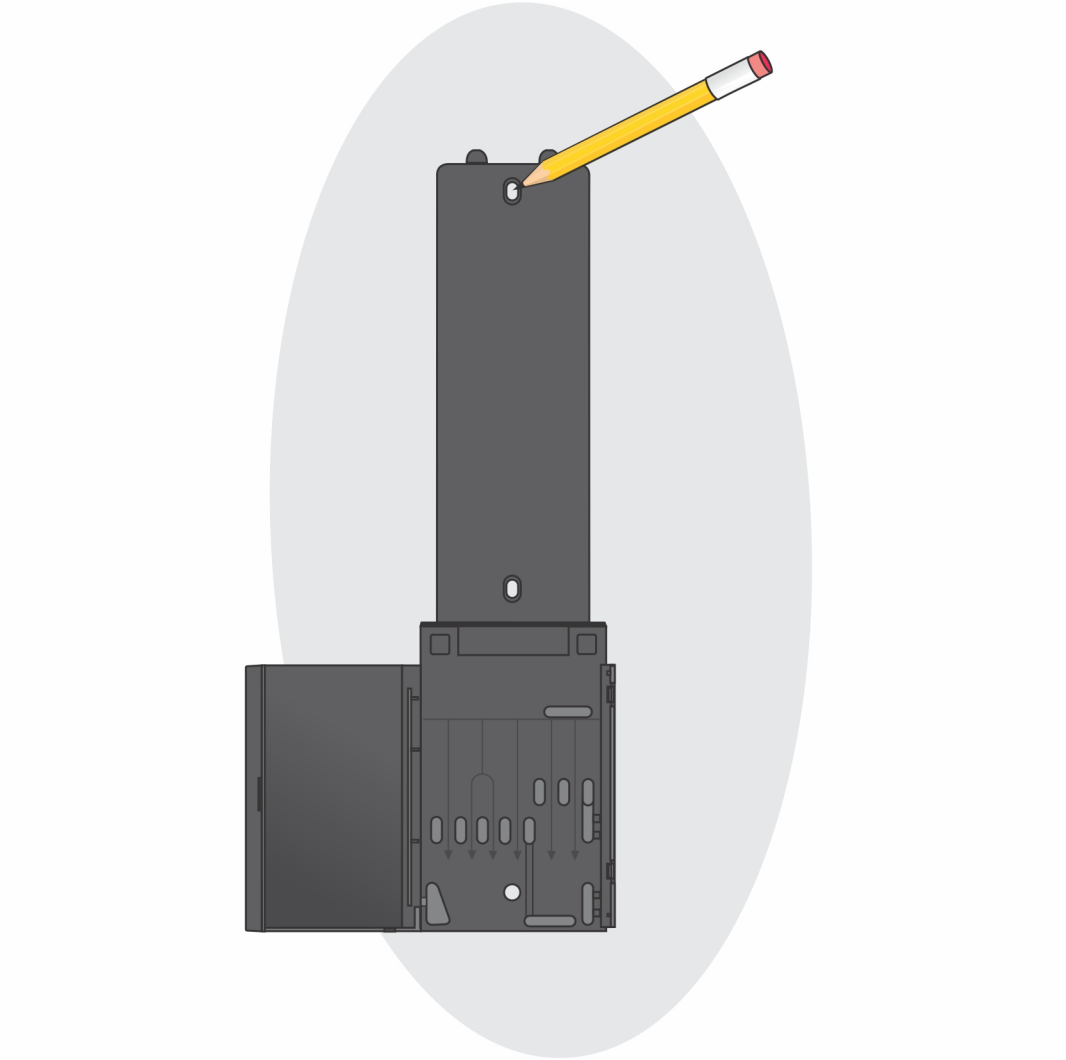
Installing device on Wall Mount

Steps

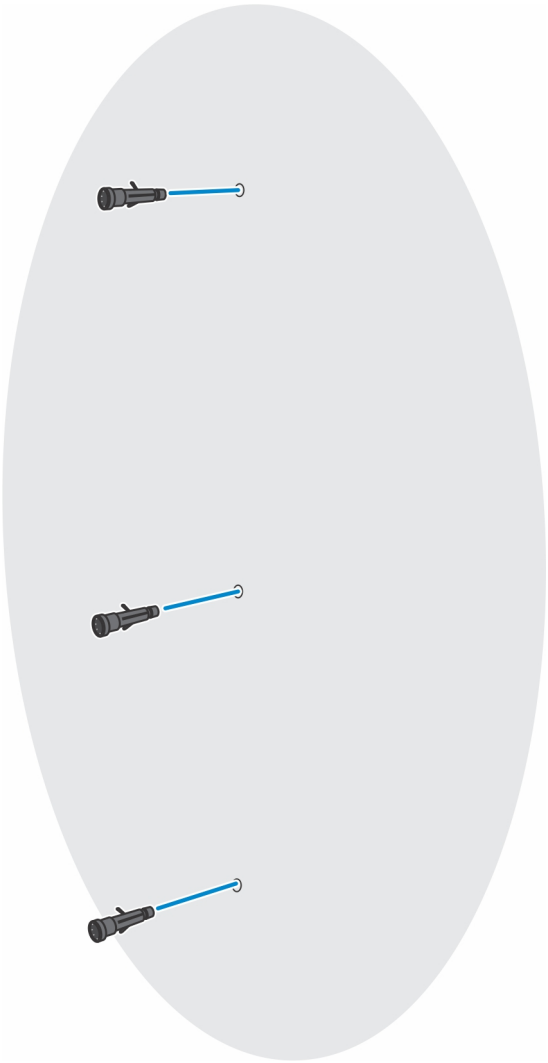
1. Full Function
   a. Press the release button to open the cable cover.



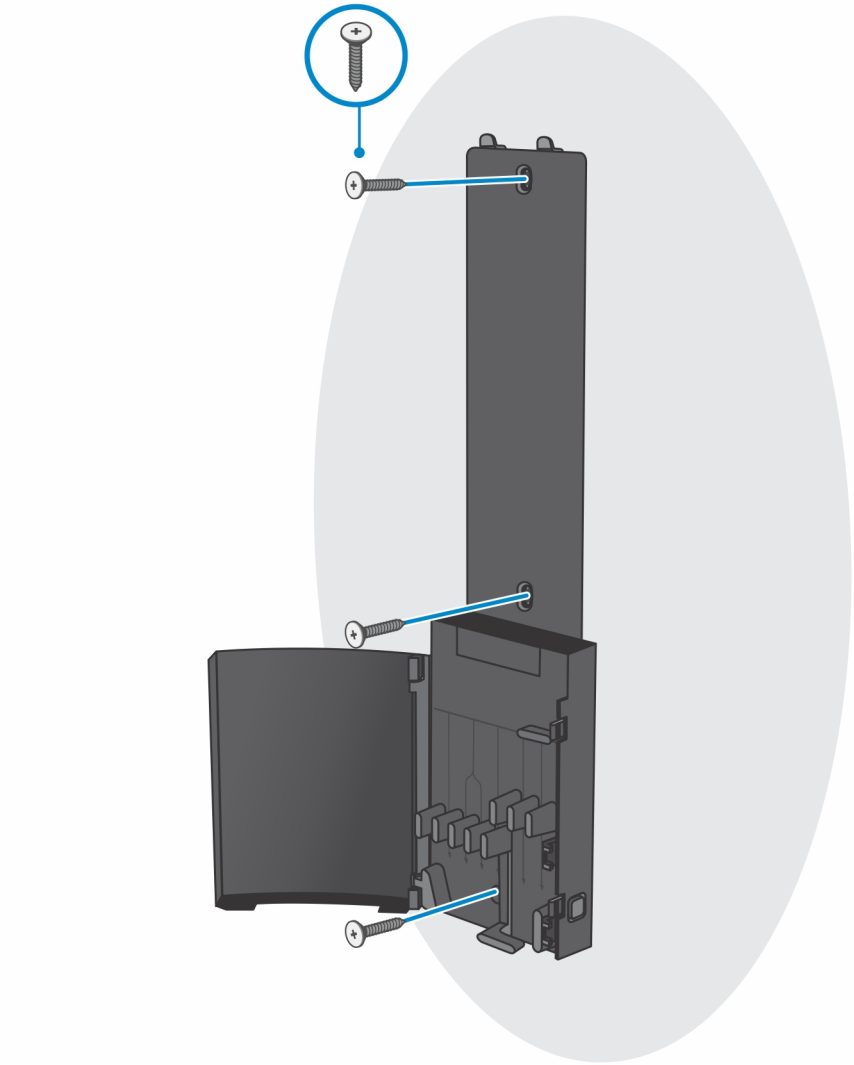
   b. Align the screw holes on the wall mount in the wall and mark them against the wall using a pencil.



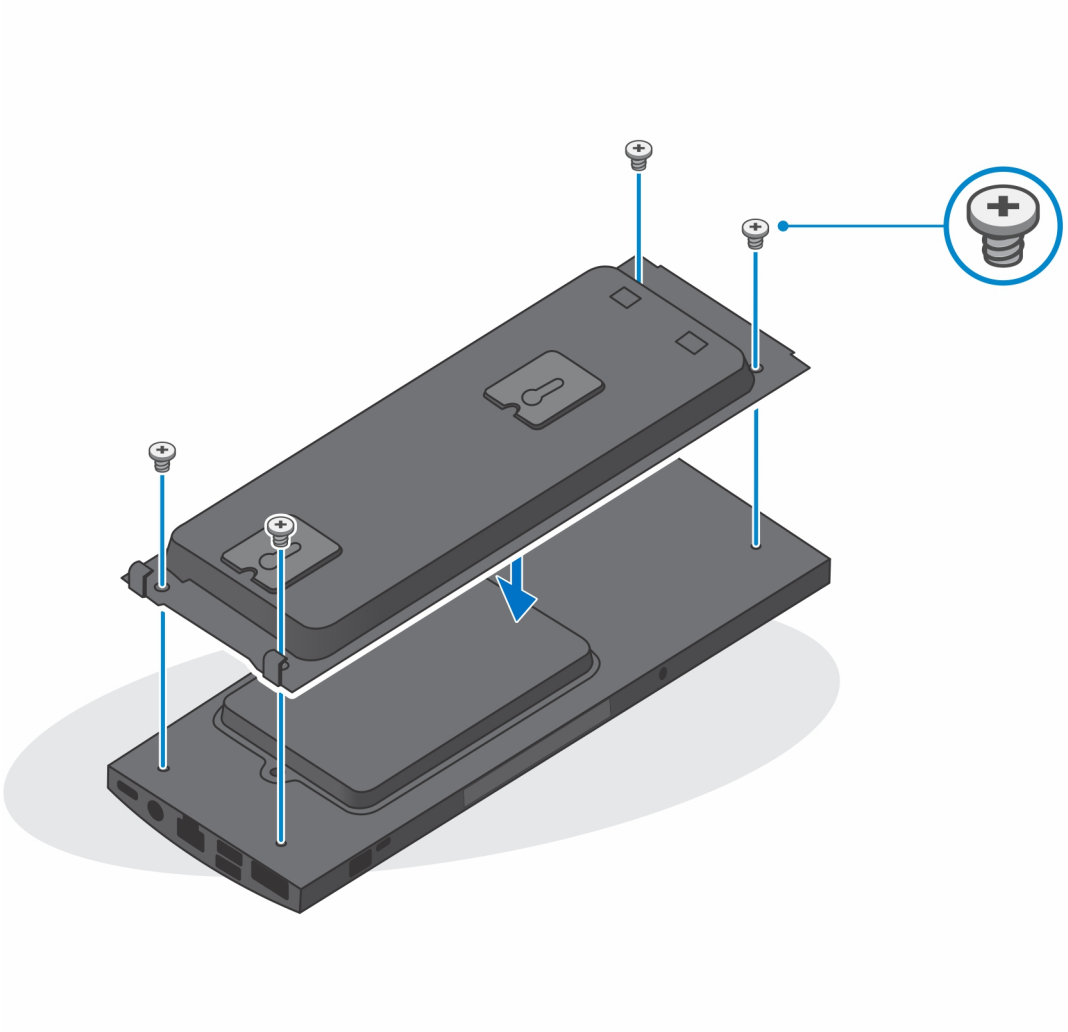
c. Drill the screw marks on the wall and insert the three screw anchors into the screw holes in the wall.



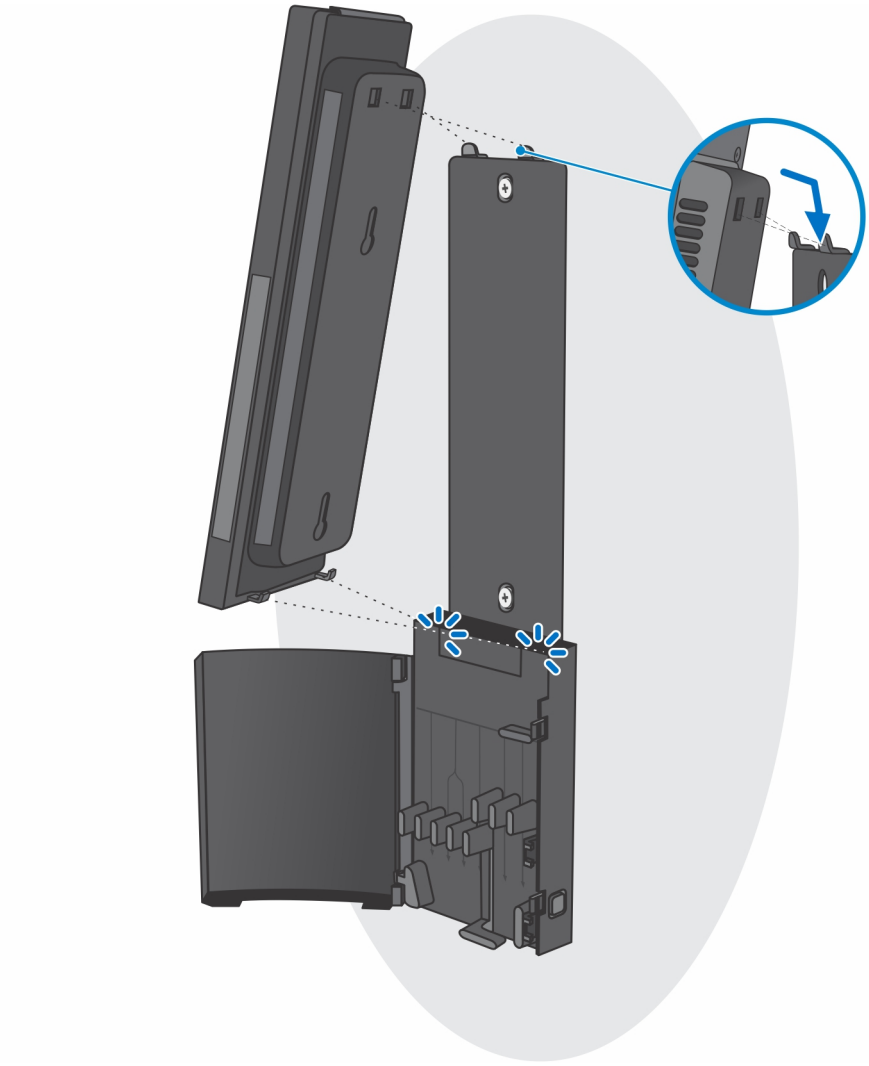
d. Align the screw holes on the wall mount with the screw holes on the wall and install the three screws to secure the wall mount in the wall.



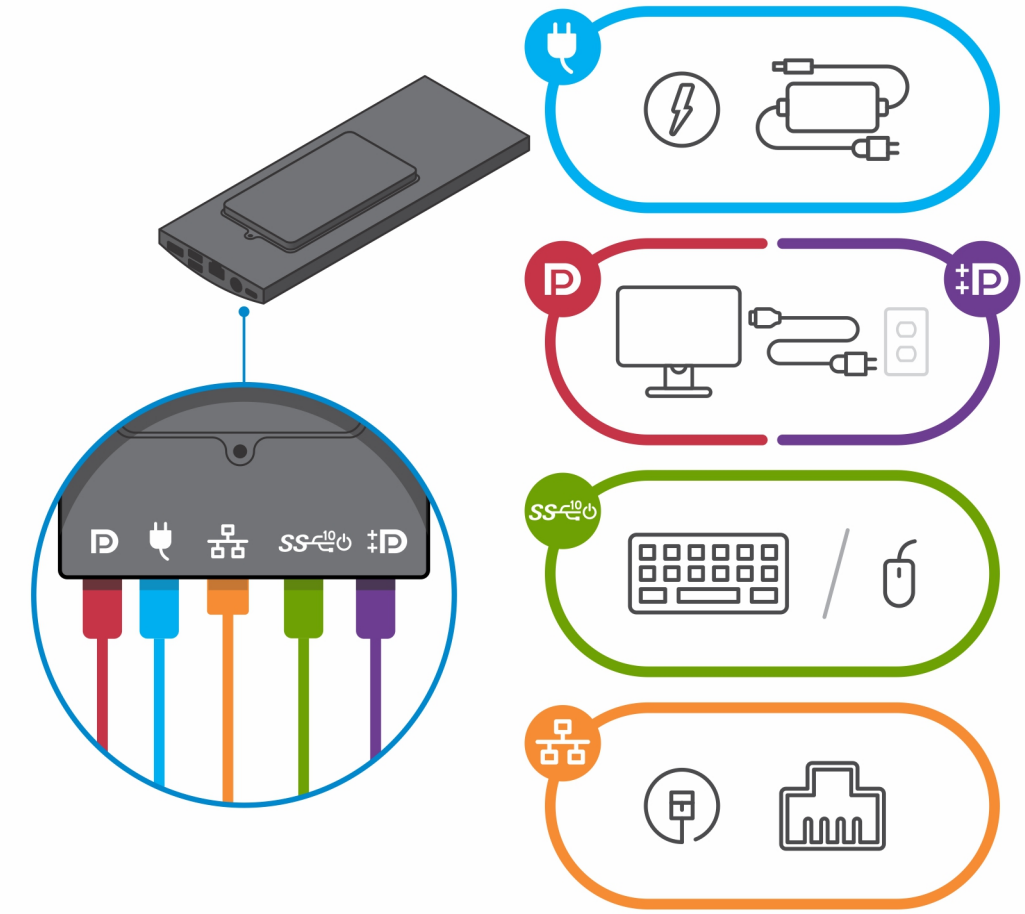
e. Align the screw holes on the device with the screw holes on the wall mount bracket.
f. Install the four screws to secure the device to the wall mount bracket.



g. Insert the hooks on the mounting bracket of the wall mount into the slots on the wall mount bracket module.
h. Align and insert the hooks on the wall mount bracket module into the slots on the wall mount until it clicks into place

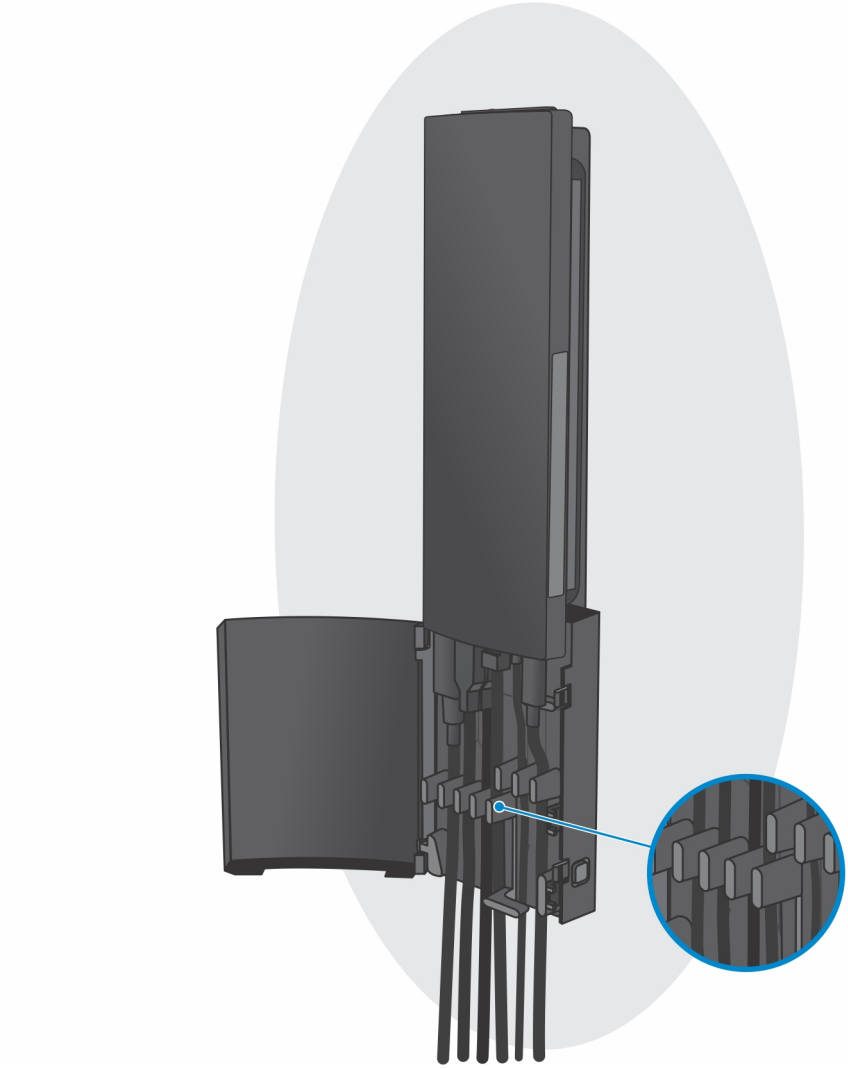


i. Connect the power, network, keyboard, mouse, and display cables to the device and to the power outlet.



j. To avoid any pinching or crimping of the cables while closing the stand cover, it is recommended that you route the cables as indicated in the image.

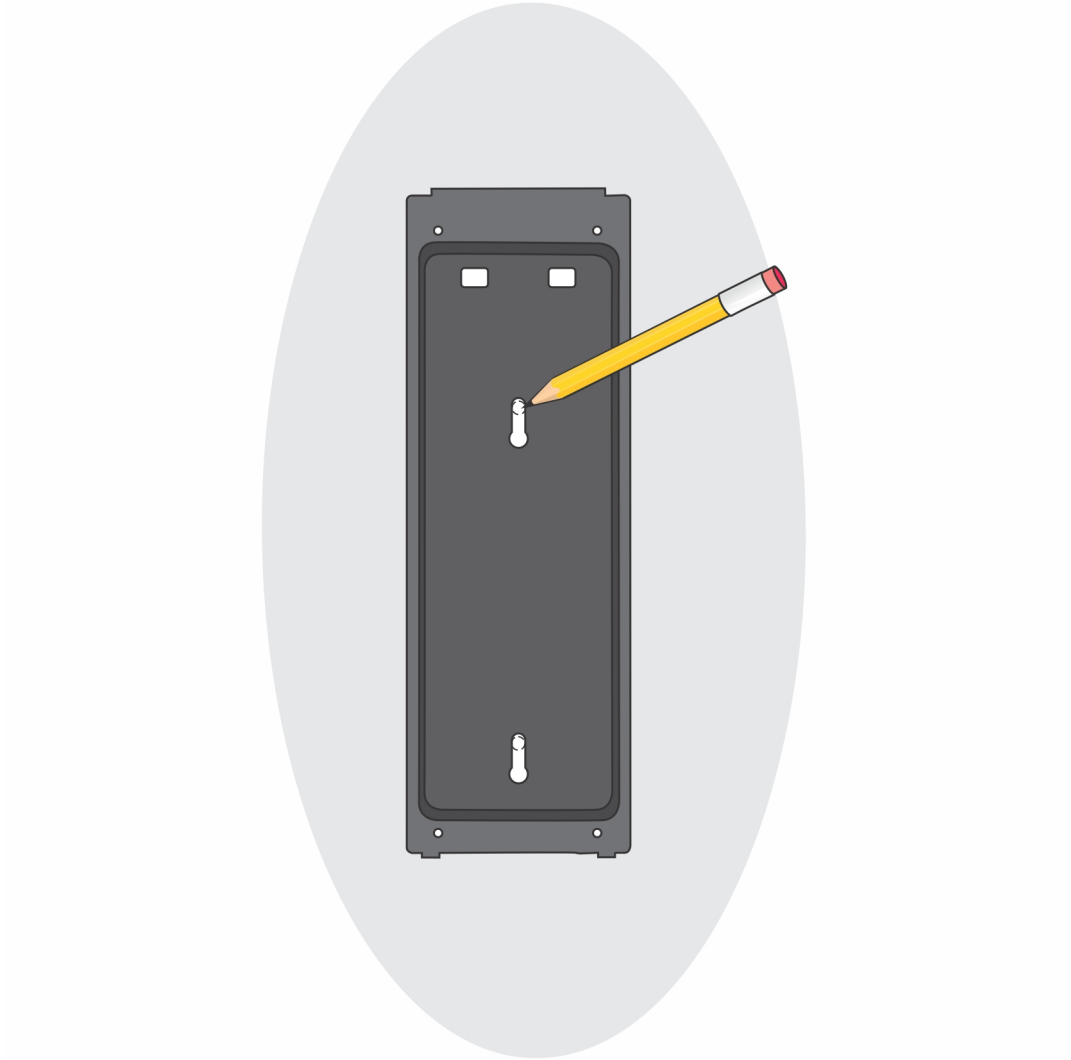
NOTE: All the cables and ports are used depending on the peripherals chosen and the configuration of the computer.



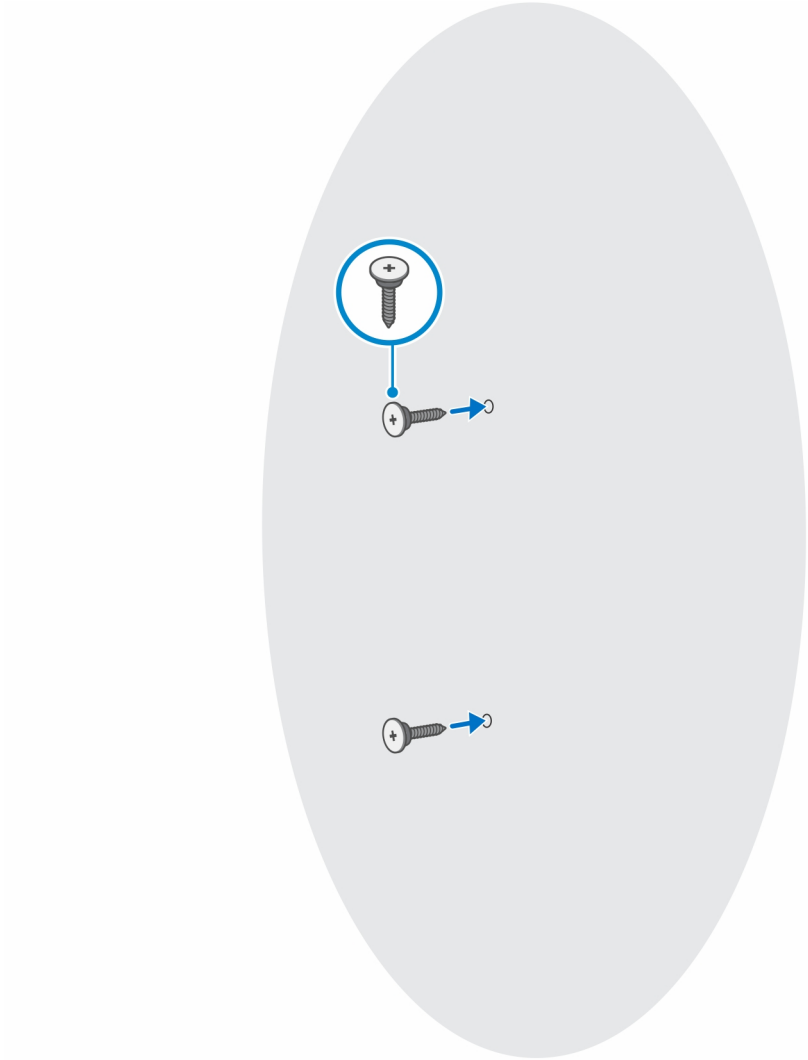
k. Close the stand cover.

l. Lock the device and the stand cover.

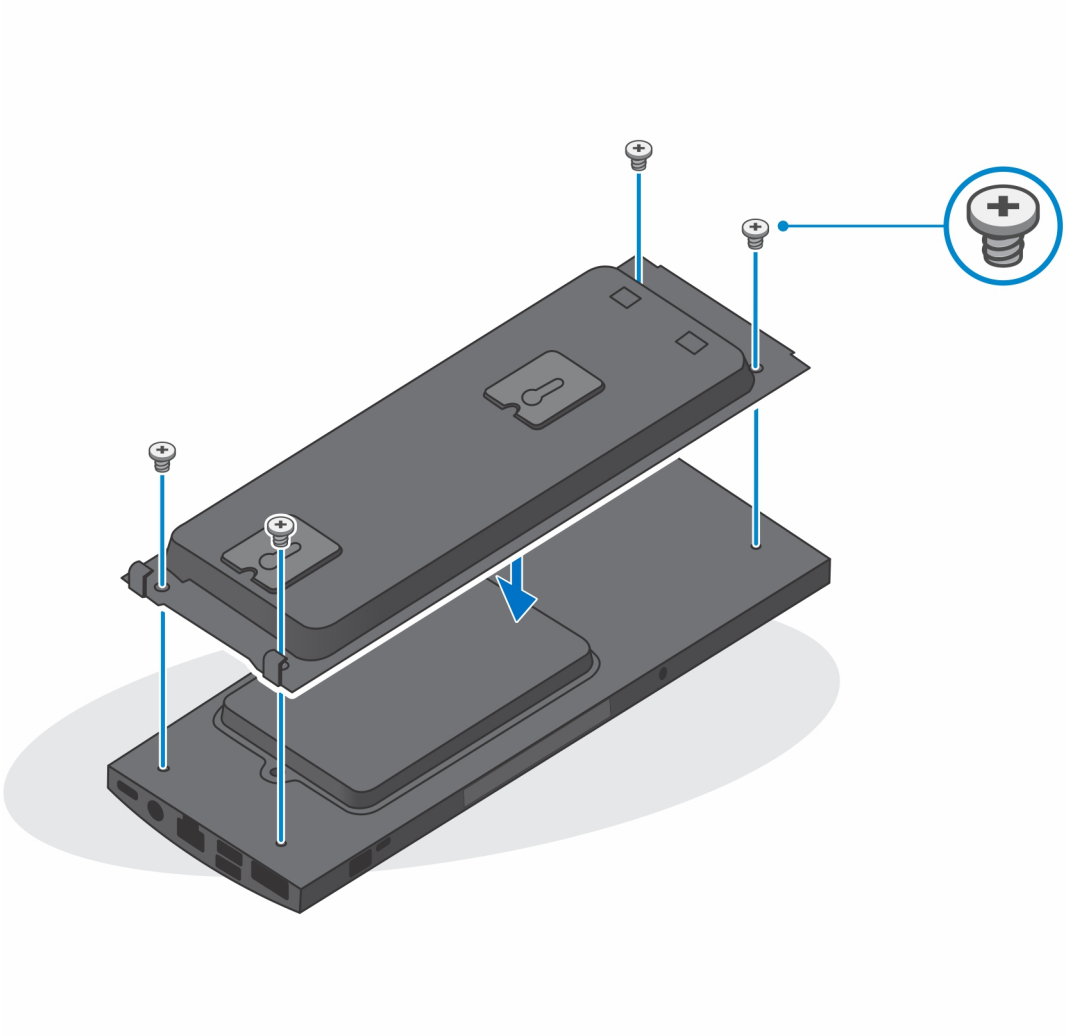
2. Simple Function
   a. Align the screw holes on the wall mount in the wall and mark them using a pencil.



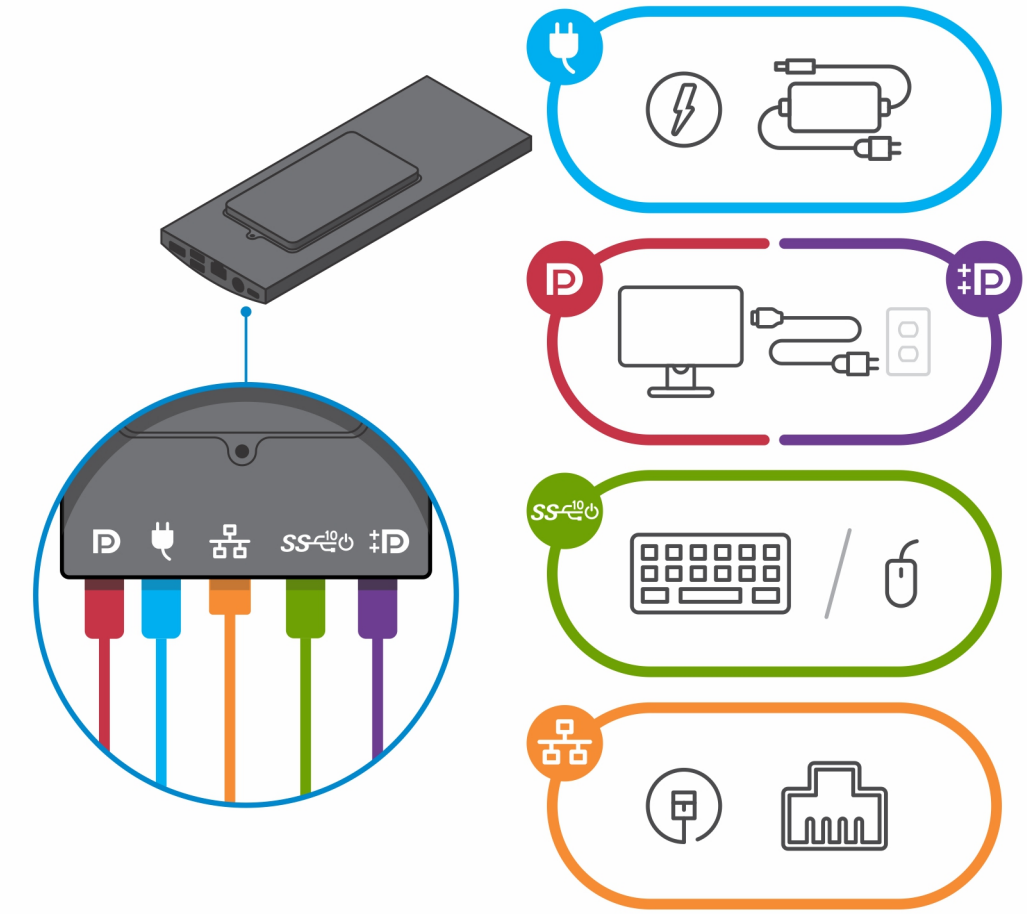
b. Drill the screw marks on the wall and insert the two screws into the screw holes in the wall.



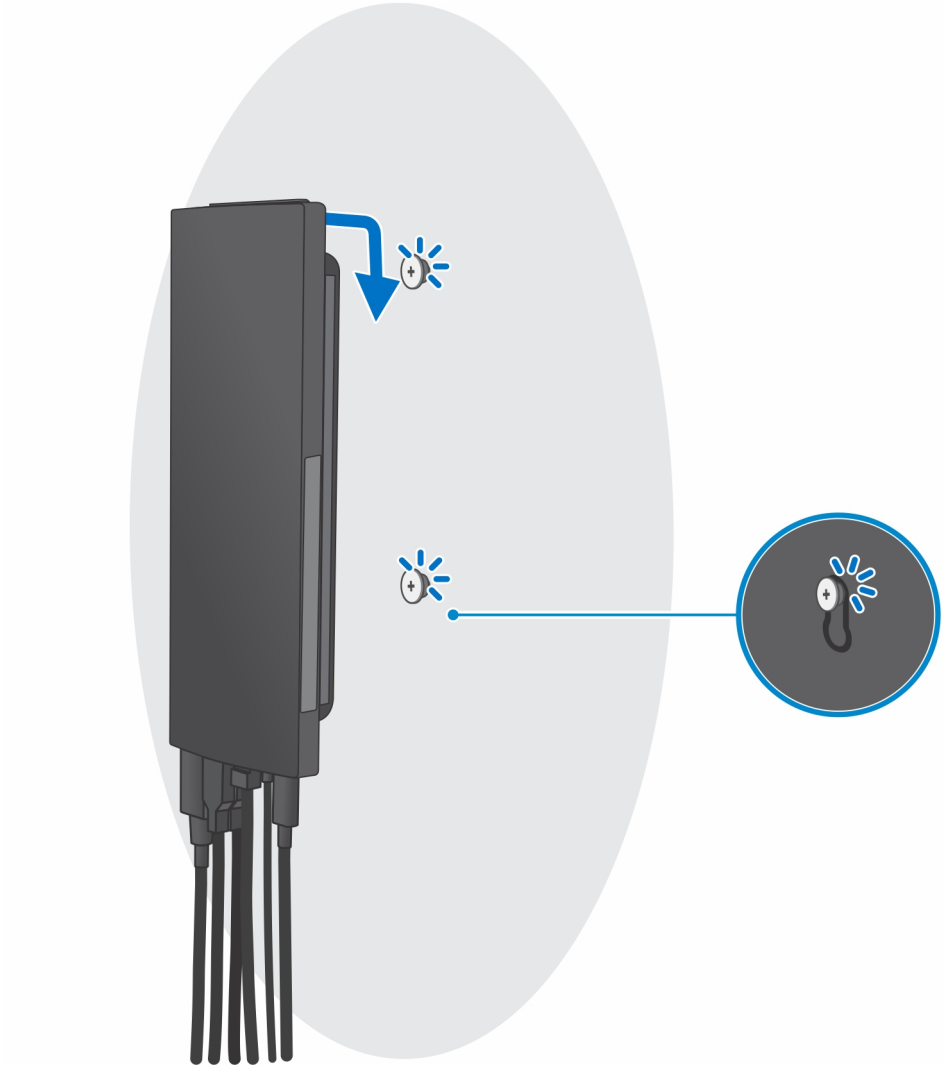
c. Align the screw holes on the device with the screw holes on the wall mount bracket.
d. Install the four screws to secure the device to the wall mount bracket.



e. Connect the power, network, keyboard, mouse, and display cables to the device and to the power outlet.



f. Align the screws on the wall with the retention clips on the wall mount bracket module.
g. Mount the wall mount bracket module in the screws on the wall.



h. Press the power button to turn on the device.

Removing the device from Wall Mount

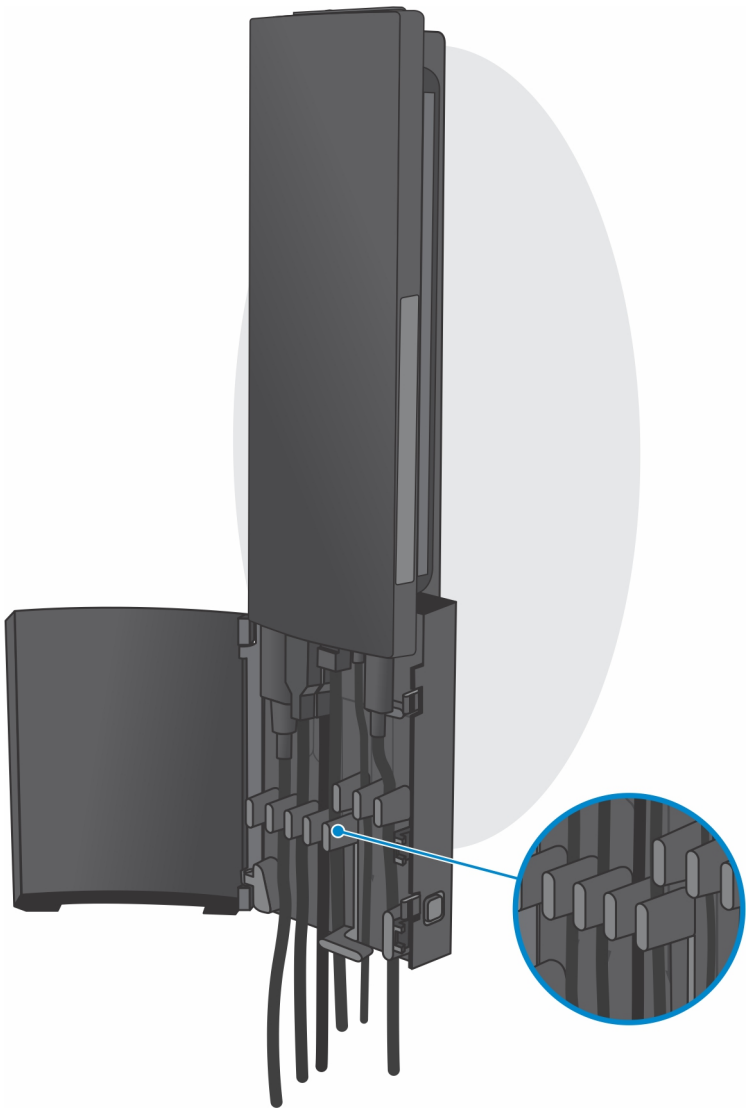
Prerequisites

1. Follow the procedure in before working inside your device.

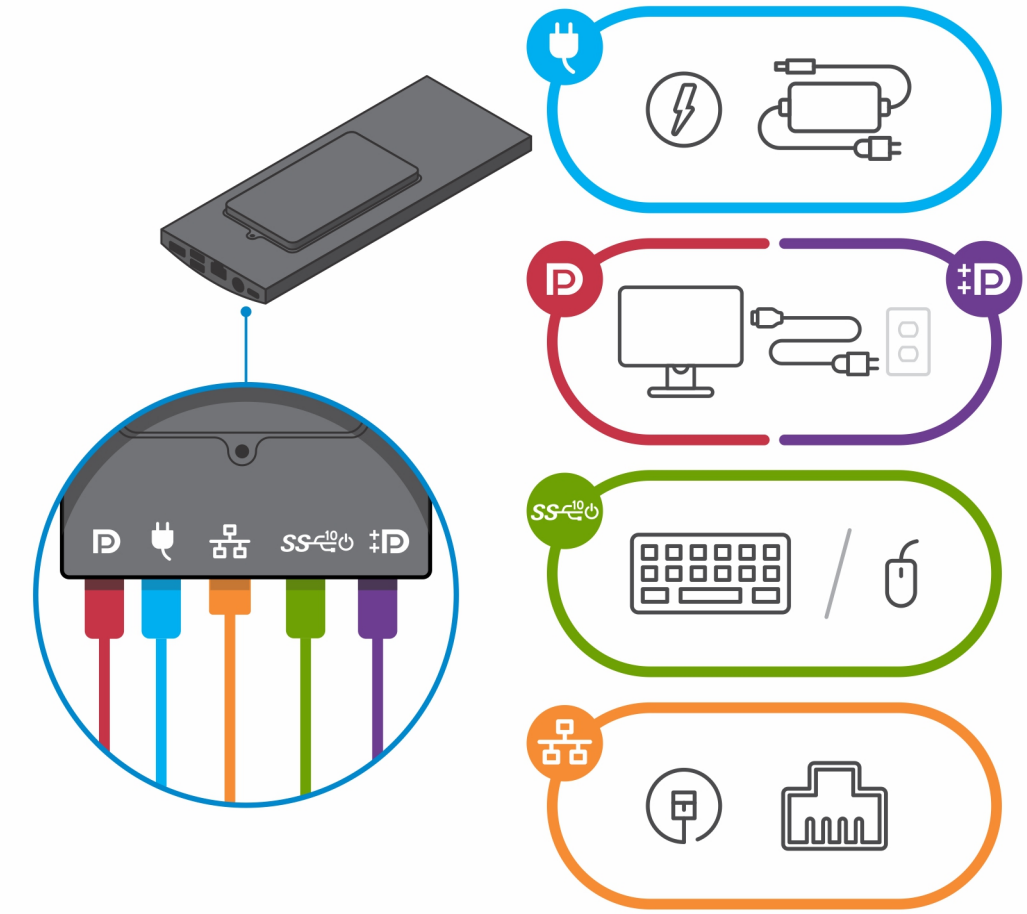
Steps

1. Turn off your device.
2. For full function wall mount:
   a. Unlock the wall mount module.

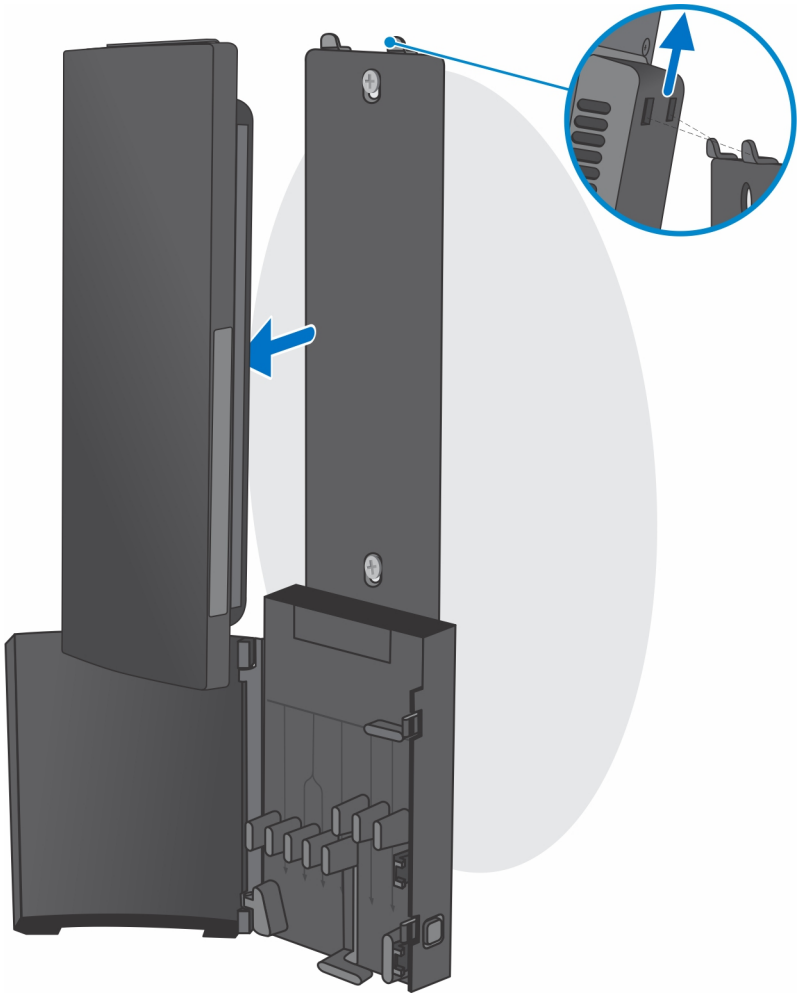
b. Open the wall mount cover.



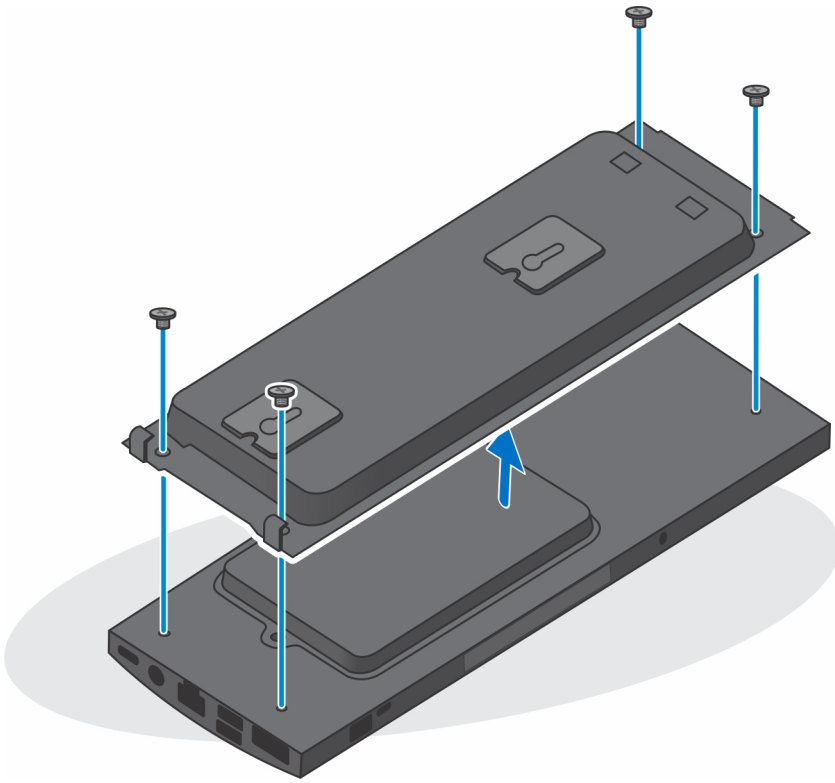
c. Disconnect the keyboard, mouse, network, power, and display cable from the device.



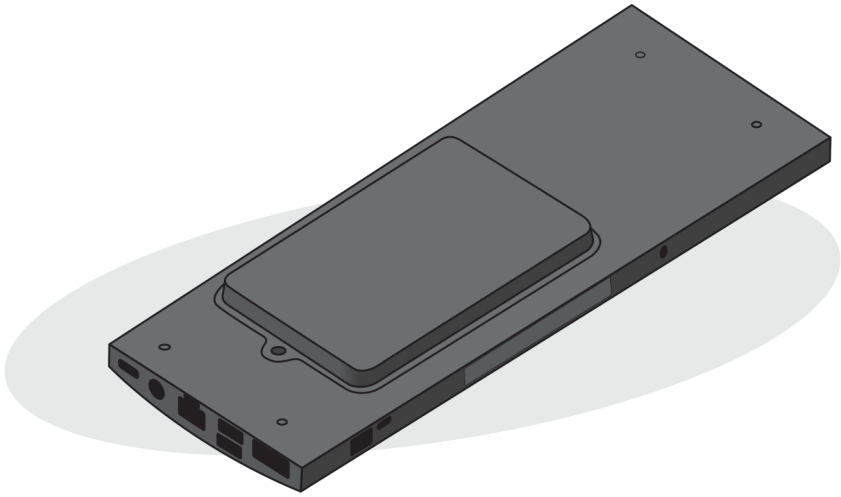
d. Snap open the wall mount bracket module from the slots on the wall mount.



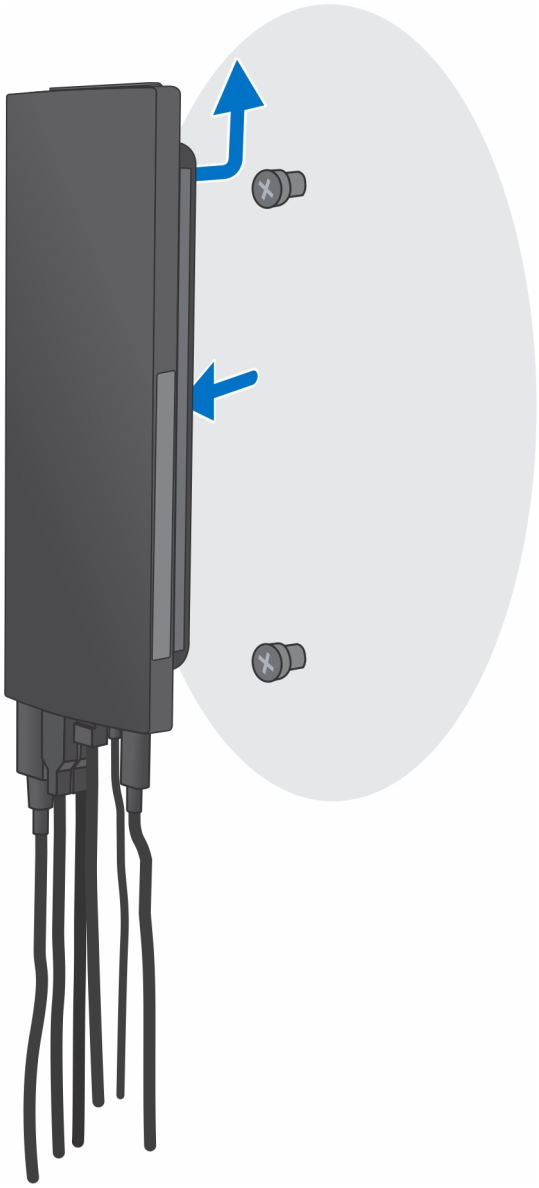
e. Remove the four screws that secure the device to the wall mount bracket.



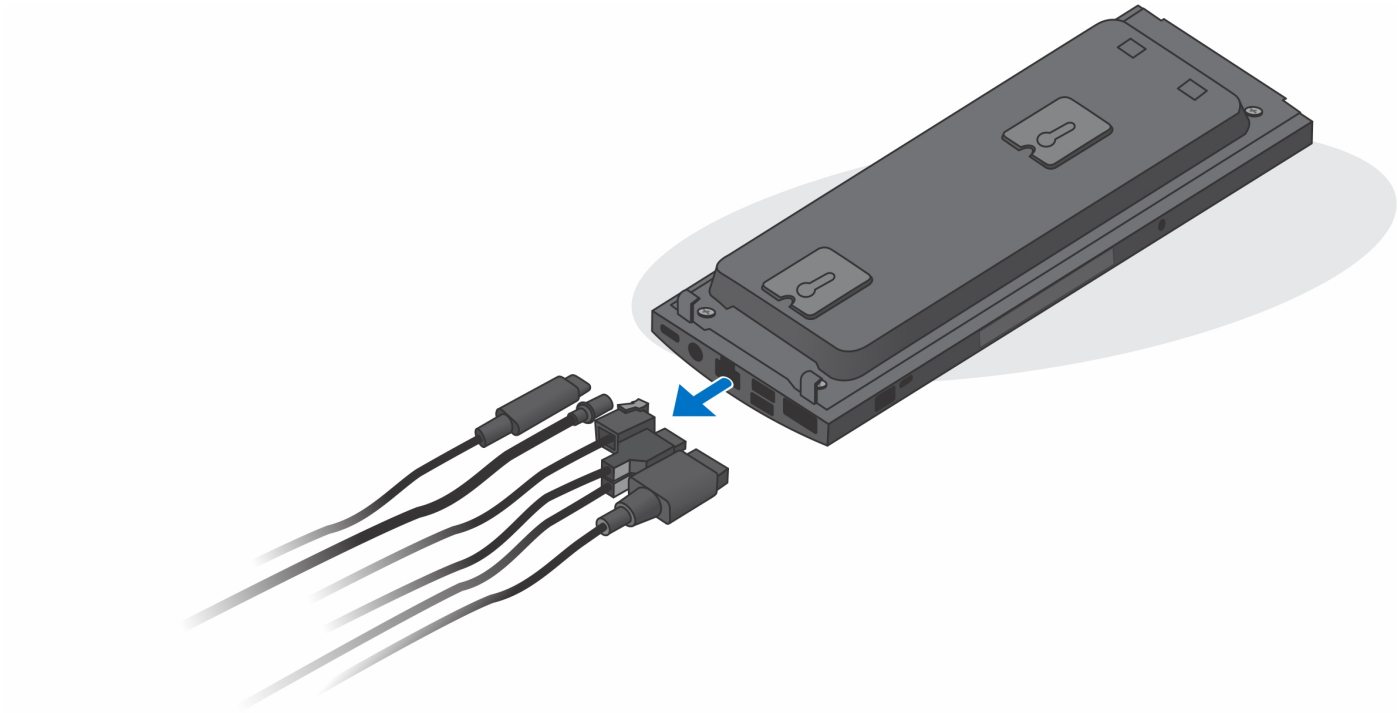
f. Lift the device away from the wall mount bracket.



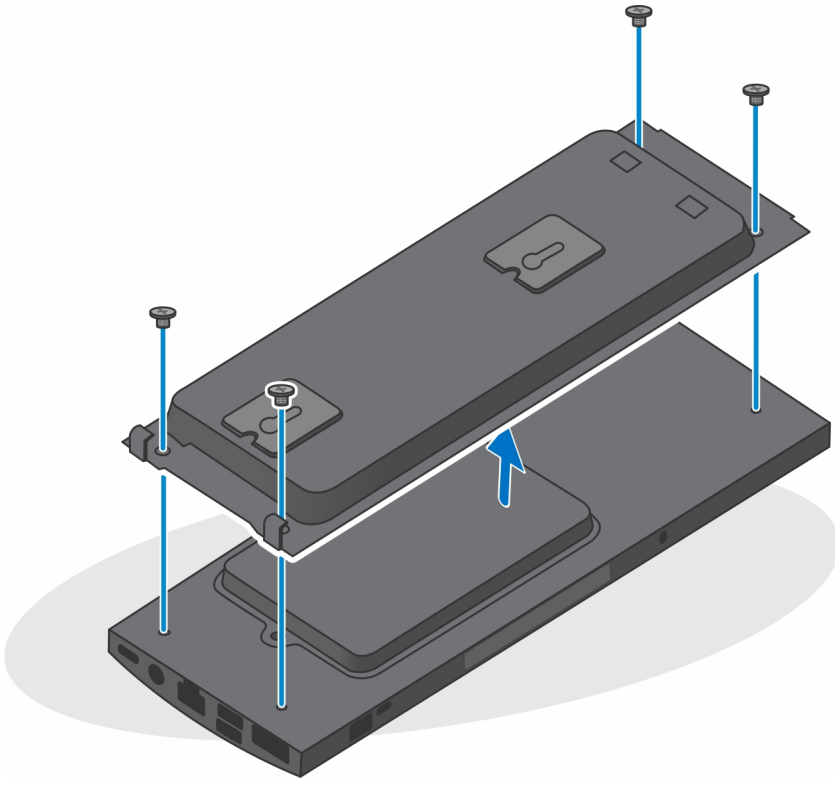
3. For simple function wall mount:
   a. Unmount the wall mount bracket module from the wall.



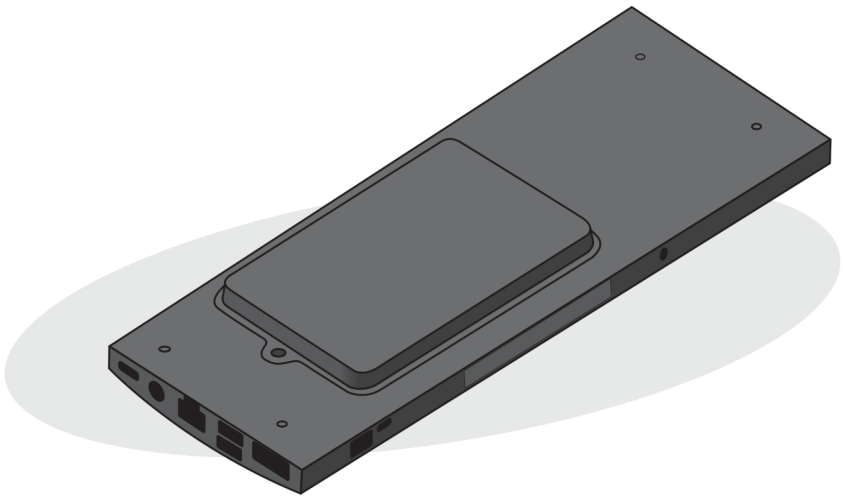
   b. Disconnect the keyboard, mouse, network, power adapter, and display cable from the device.



c. Remove the four screws that secure the device to the wall mount bracket.



d. Lift the device away from the wall mount bracket.



4. Press and hold the power button while the device is unplugged to ground the system board.

   NOTE: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface at the same time as touching a connector on the back of the computer.

3

Removing and installing components

NOTE: The images in this document may differ from your computer depending on the configuration you ordered.

Topics:

Recommended tools

The procedures in this document require the following tools:

- Phillips #0 screwdriver
- Phillips #1 screwdriver
- Plastic scribe

Screw List

The following table shows the screw list and the images for different components.

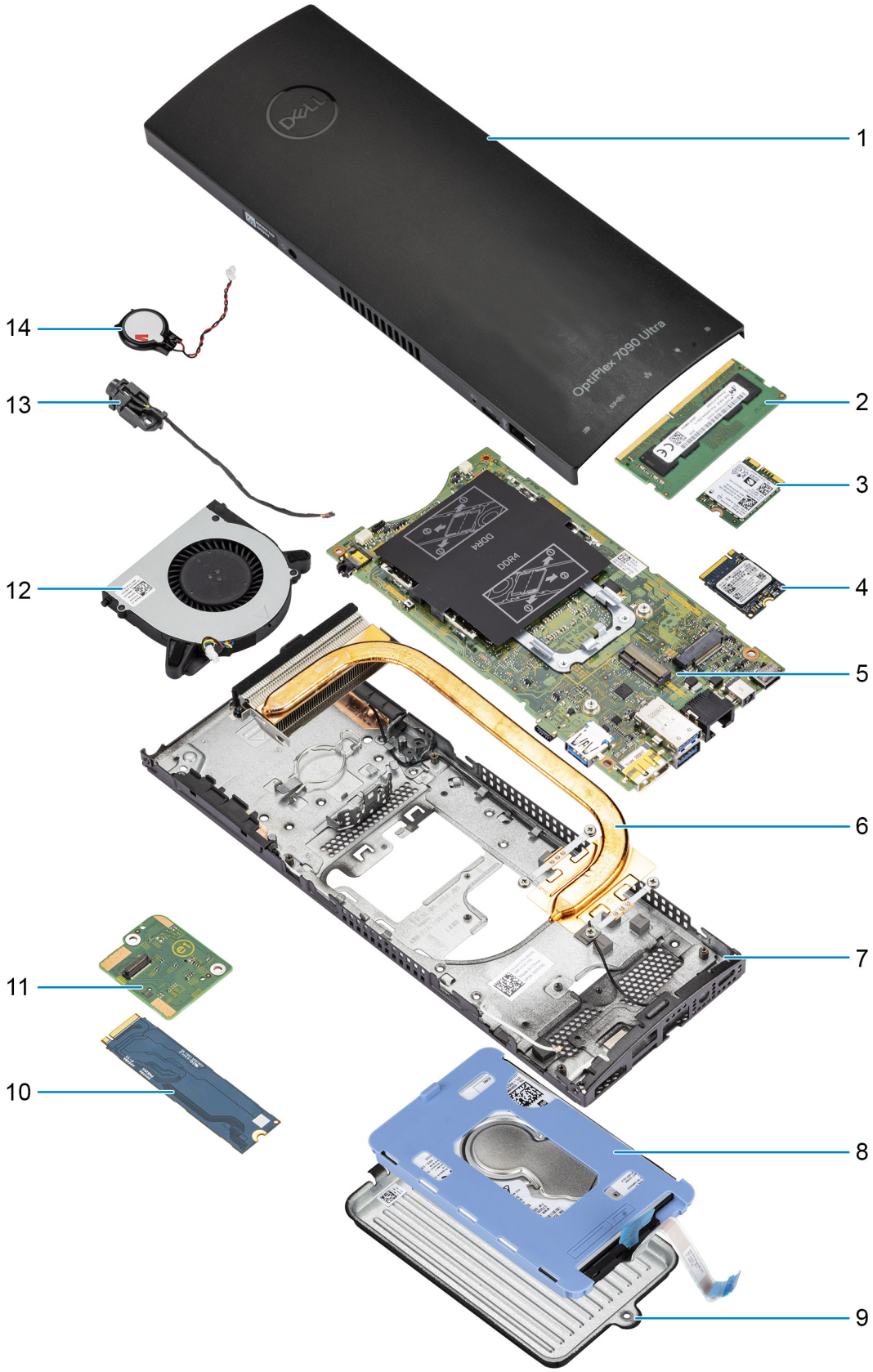
Table 1. Screw Size List

Component	Screw type	Quantity	Image
Power button	M2x3	1	
System board	M2x3 M2x3 (captive screw)	4 1	 

Table 1. Screw Size List (continued)

Component	Screw type	Quantity	Image
Hard-drive assembly (or non Hard-drive assembly) or SSD 2230/2280 cover	M2x3	1	
M.2 WLAN card	M2x3.5	1	
M.2 2230 Solid-state drive or EMMC	M2x3.5	1	
M.2 (Option 2230 SSD or 2280 SSD)	M2x3.5	1	
Daughter board	M2x3.5	2	
M.2 Standoff	M3x2.4	1	

Major components of your system



1. Cover

2. Memory module
3. WLAN card
4. Solid-state drive
5. System board
6. Heat-sink
7. Chassis
8. Hard-drive assembly
9. Hard-drive cover
10. Solid-state drive in the hard-drive bay
11. Solid-state daughter board
12. System fan
13. Power button
14. Coin-cell battery

NOTE: Dell provides a list of components and their part numbers for the original system configuration purchased. These parts are available according to warranty coverages purchased by the customer. Contact your Dell sales representative for purchase options.

Hard-drive assembly

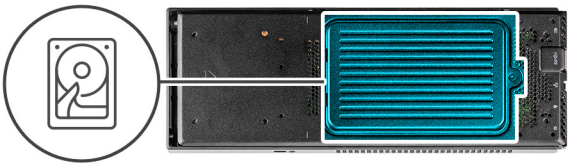
Removing the hard-drive assembly

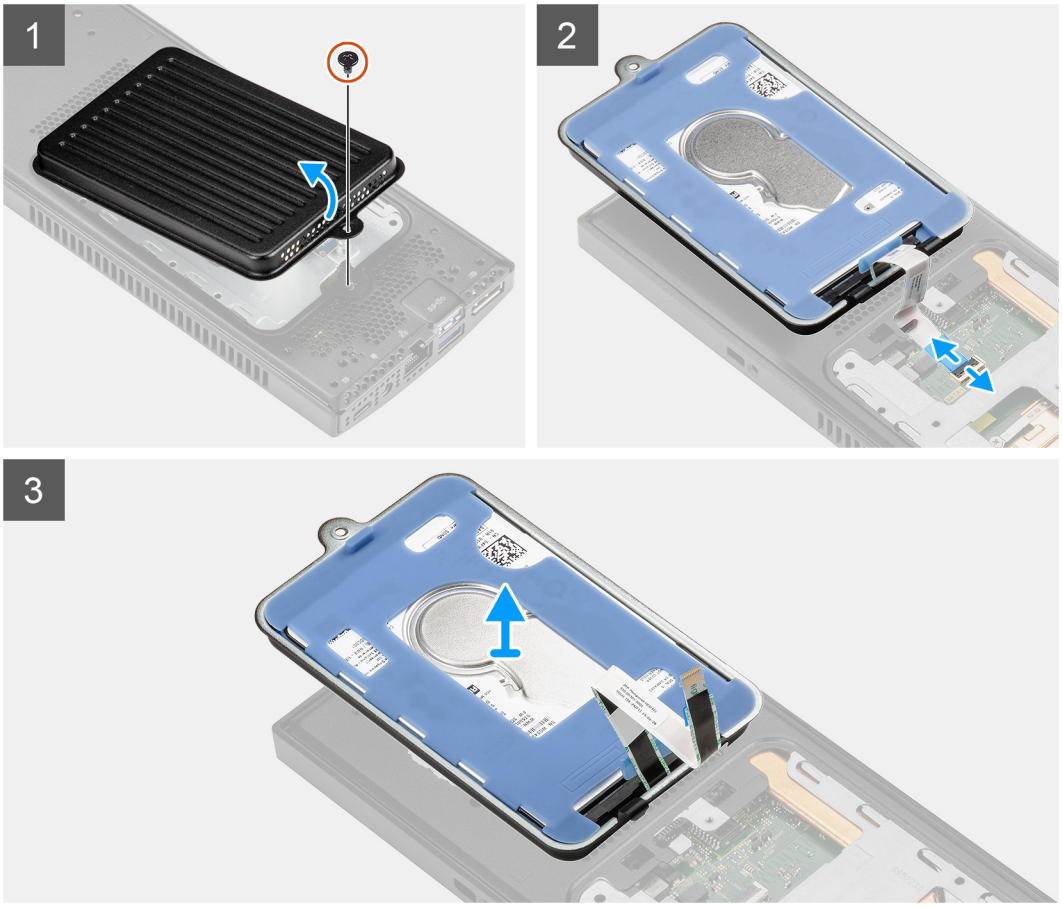
Prerequisites

1. Follow the procedure in before working inside your device.
2. Remove the device from fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.

About this task

The figure indicates the location of the hard-drive assembly module and provides a visual representation of the removal procedure.





Steps

1. Remove the (M2x3) screw that secures the hard-drive assembly to the chassis.
2. Turn the hard-drive assembly to access the hard-drive cable.
3. Open the latch and disconnect the hard-drive cable from the connector on the system board.
4. Carefully unroute the hard-drive cable from the routing guide on the chassis.

   NOTE: Observe the routing of the hard-drive cable inside the chassis as you remove them. Route the cable properly when you replace the component to prevent the cable from being pinched or crimped.

5. Remove the hard-drive assembly.

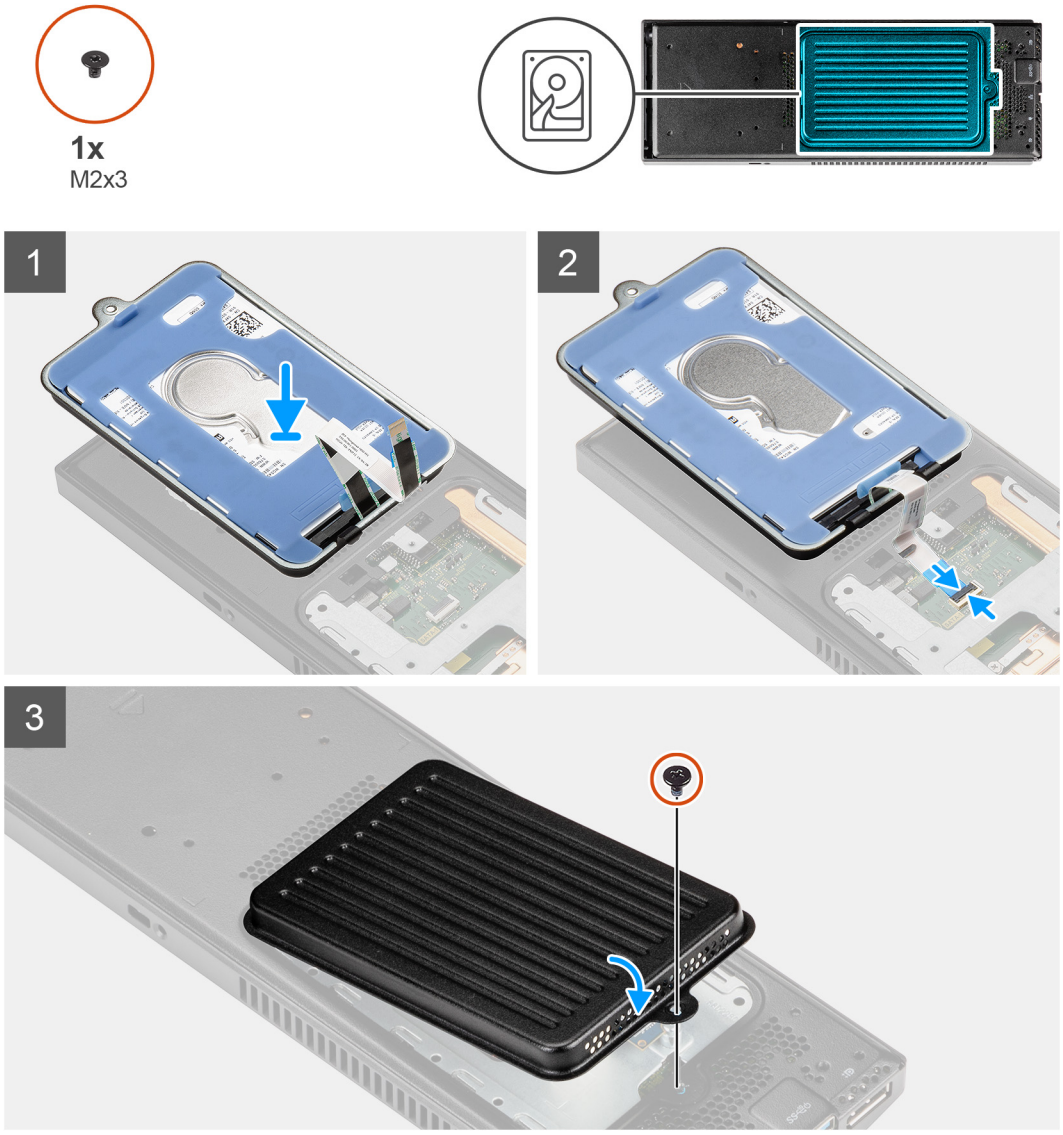
Installing the hard-drive assembly

Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The figure indicates the location of the hard-drive assembly module and provides a visual representation of the installation procedure.



Steps

1. Place the hard-drive assembly on the cover.
2. Route the hard-drive cable through the routing guide on the chassis.
3. Connect the hard-drive cable to the connector on the system board and close the latch to secure the cable.
4. Turn the hard-drive assembly module and align the tabs on the hard-drive assembly with the slots on the chassis.
5. Align the screw hole on the hard-drive assembly with the screw hole on the chassis.
6. Replace the M2x3 screw to secure the hard-drive assembly to the chassis.

Next steps

1. Install the device on Fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
2. Follow the procedure in after working on your device.

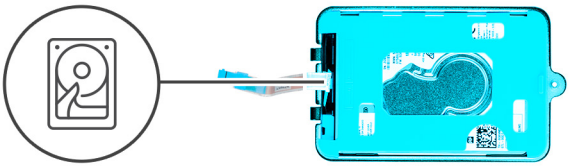
Hard-drive bracket

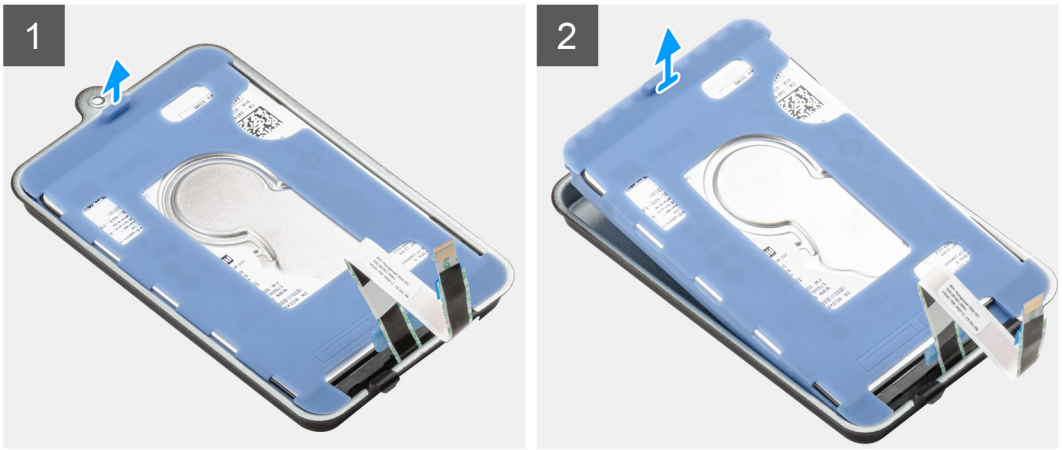
Removing the hard-drive bracket

Prerequisites

1. Follow the procedure in before working inside your device.
2. Remove the device from fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
3. Remove the hard-drive assembly.

About this task





Steps

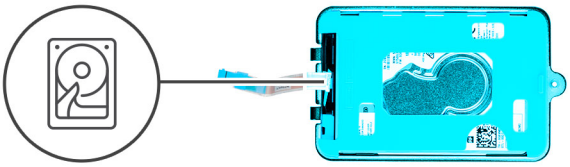
Pull the rubber tab on the protective sleeve and lift the hard-drive module out from the hard-drive bracket.

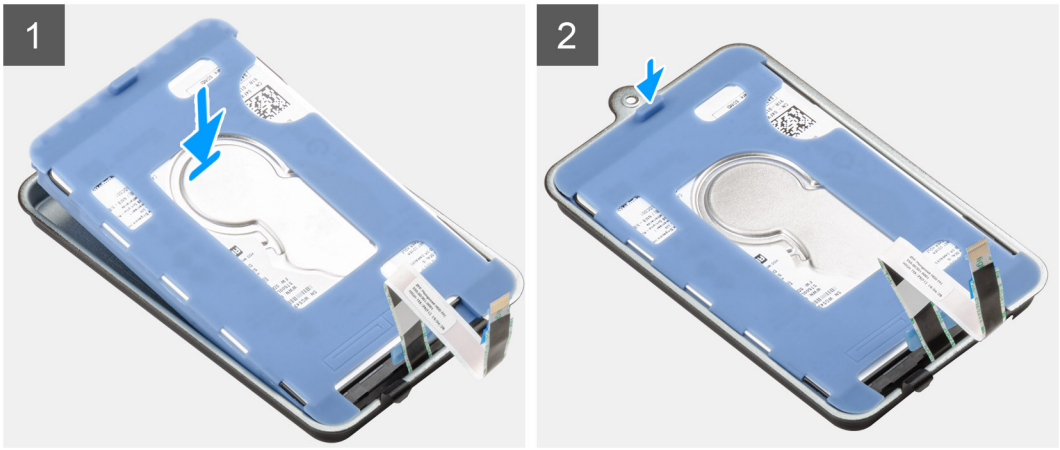
Installing the hard-drive bracket

Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task





Steps

1. Align and place the hard drive on the bracket.
2. Gently push the hard-drive into the bracket.

Next steps

1. Install the hard-drive assembly.
2. Install the device on Fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
3. Follow the procedure in after working on your device.

Hard drive

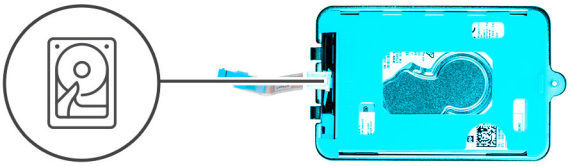
Removing the hard drive

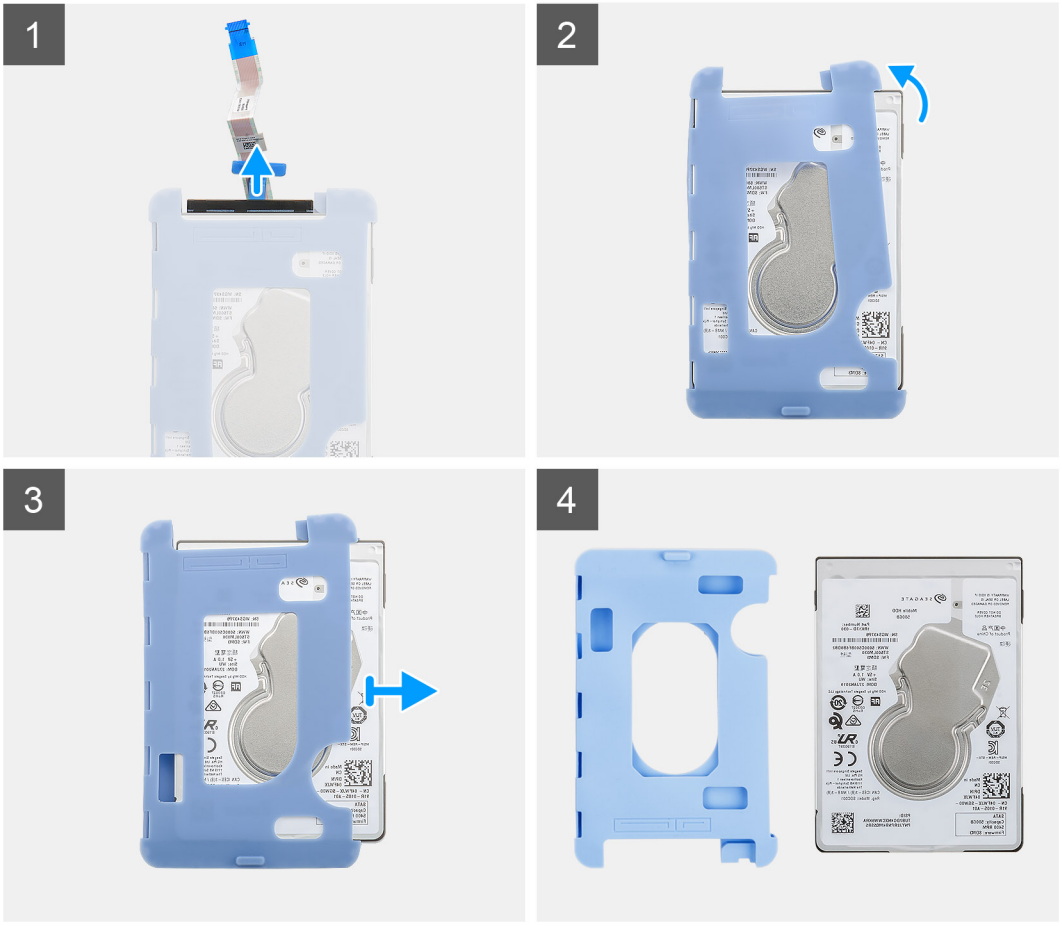
Prerequisites

1. Follow the procedure in before working inside your device.
2. Remove the device from fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
3. Remove the hard-drive assembly.
4. Remove the hard-drive bracket.

About this task

The figure indicates the location of the hard-drive module and provides a visual representation of the removal procedure.





Steps

1. Disconnect the hard-drive cable from the connector on the hard drive.
2. Release the protective sleeve from the hard-drive.
3. Gently pull the hard-drive out of the protective sleeve.

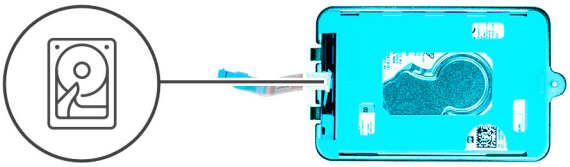
Installing the hard drive

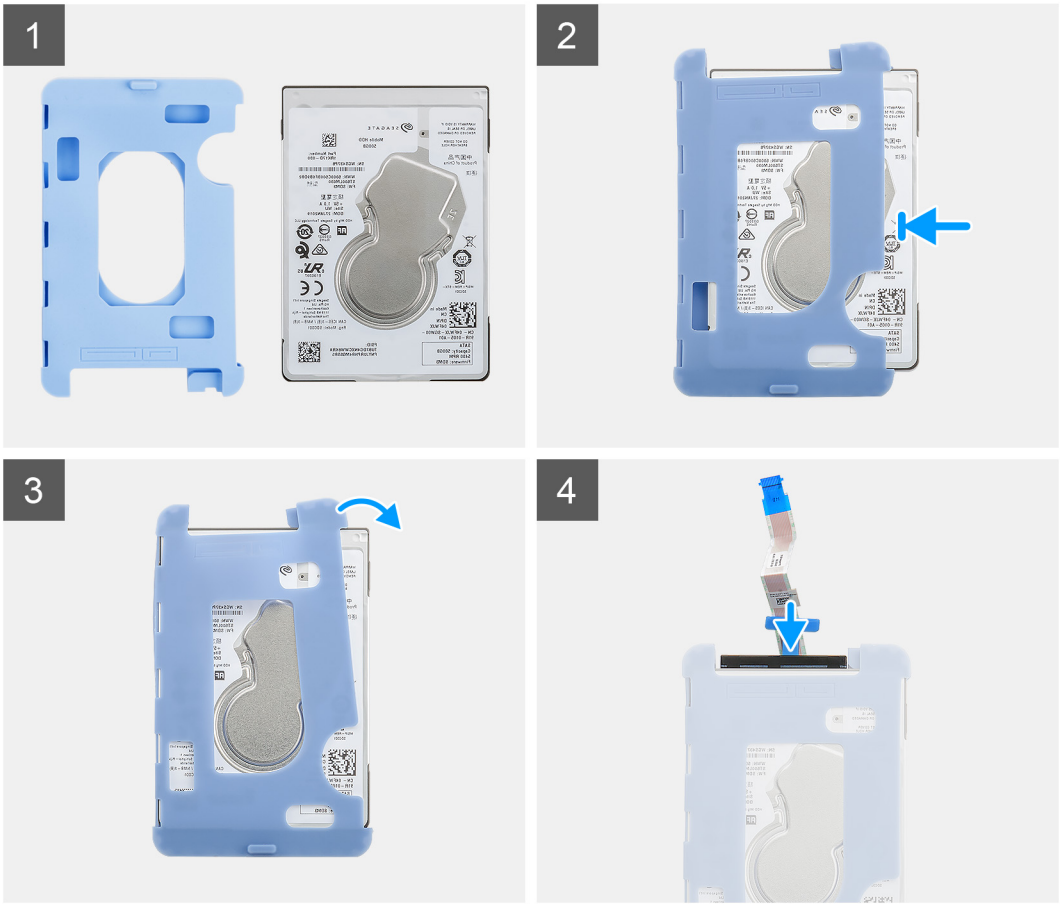
Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The figure indicates the location of the hard-drive module and provides a visual representation of the installation procedure.





Steps

1. Insert the hard drive into the protective sleeve.

   NOTE: Ensure to match the mark on the protective sleeve with the hard drive PIN and connector location.

2. Pull the protective sleeves along the hard-drive edges.
3. Connect the hard-drive cable to the connector on the hard drive.

Next steps

1. Install the hard-drive bracket.
2. Install the hard-drive assembly.
3. Install the device on Fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
4. Follow the procedure in after working on your device.

Solid-state drive in the hard-drive bay

NOTE: For systems with solid-state drive in the hard-drive bay will not support hard drive.

Removing the M.2 2230 solid-state drive

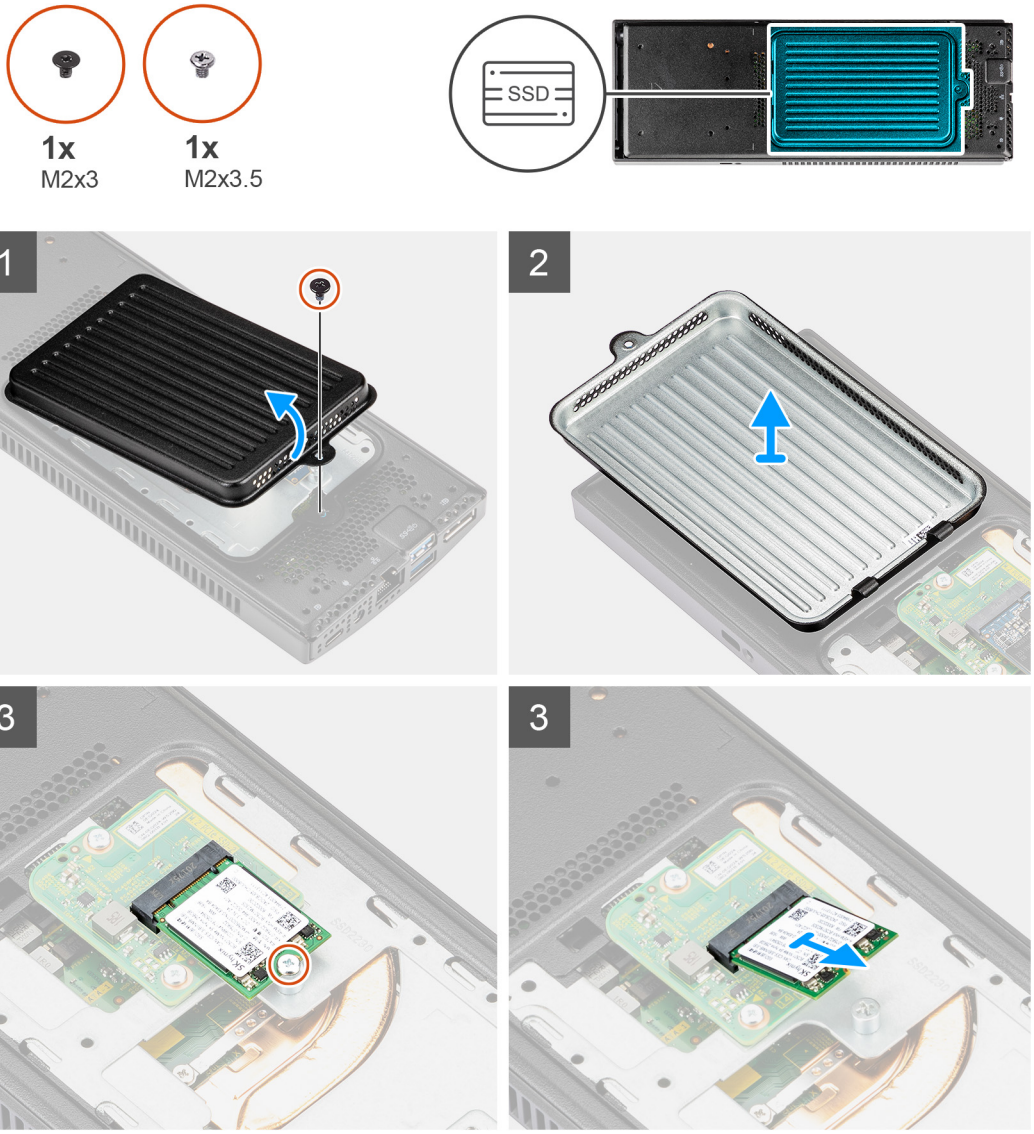
For systems with solid-state drive in the hard drive bay will not support hard drive.

Prerequisites

1. Follow the procedure in before working inside your device.
2. Remove the device from fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.

About this task

The figure indicates the location of the M.2 2230 solid-state drive and provides a visual representation of the removal procedure.



Steps

1. Remove the (M2x3) screw that secures the solid-state drive cover to the chassis.
2. Turn the solid-state drive cover and remove it from the chassis to access the M.2 2230 solid-state drive.
3. Remove the (M2x3.5) screw that secures the M.2 2230 solid-state drive to the chassis.
4. Lift and remove the M.2 2230 solid-state drive from the solid-state drive slot on the daughter board.

Installing the M.2 2230 solid-state drive

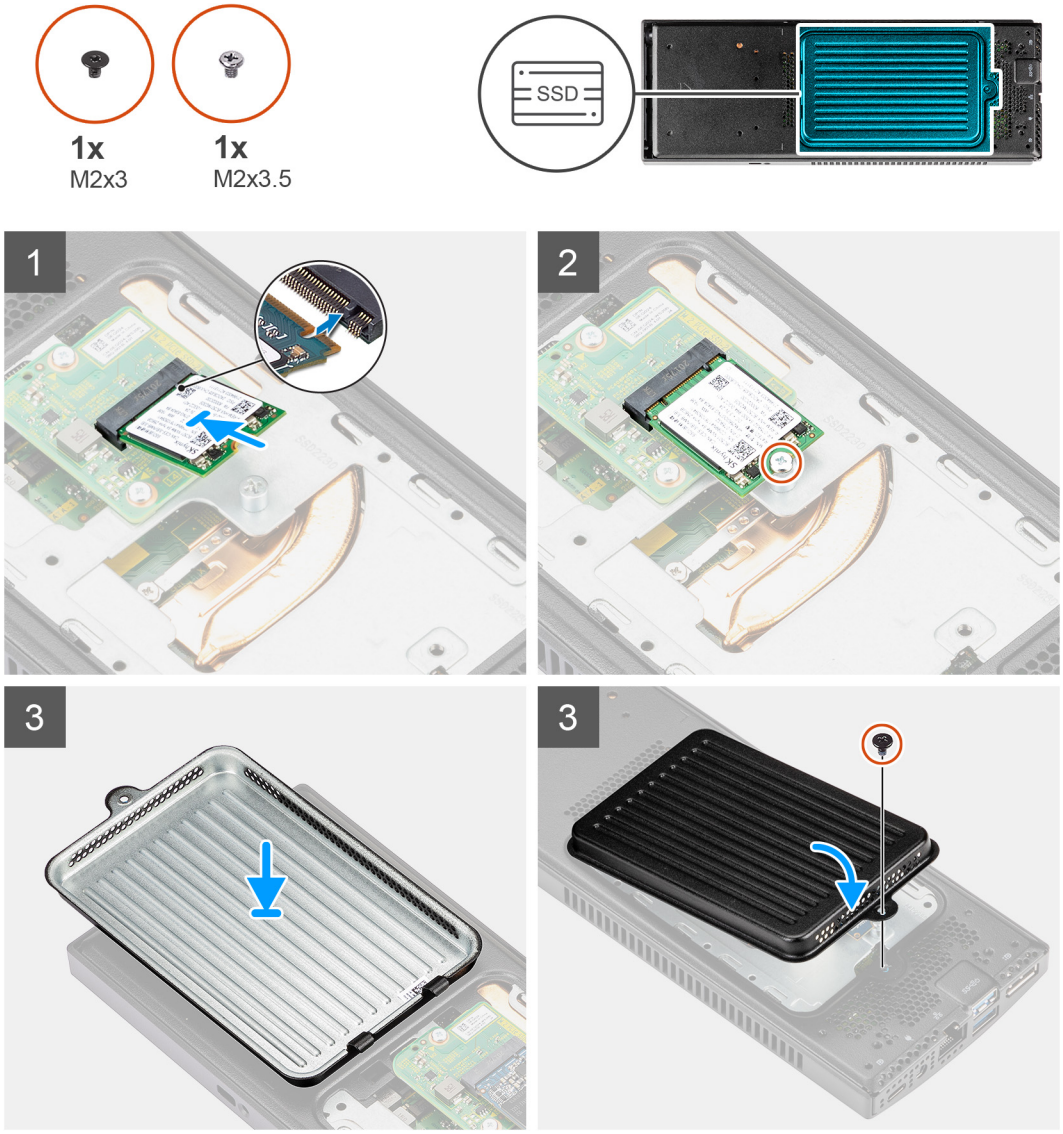
For systems with solid-state drive in the hard drive bay will not support hard drive.

Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The figure indicates the location of the M.2 2230 solid-state drive and provides a visual representation of the installation procedure.



Steps

1. Align the notch on the M.2 2230 solid-state drive with the tab on solid-state drive connector and slide the M.2 2230 solid-state drive at an angle into the slot.
2. Replace the (M2x3.5) screw to secure the M.2 2230 solid-state drive to the chassis.
3. Turn the solid-state drive cover and align the tabs on the solid-state cover with the slots on the chassis.
4. Align the screw hole on the solid-state drive cover with the screw hole on the chassis.
5. Replace the (M2x3) screw to secure the solid-state drive cover to the chassis.

Next steps

1. Install the device on Fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
2. Follow the procedure in after working on your device.

Removing the M.2 2280 solid-state drive

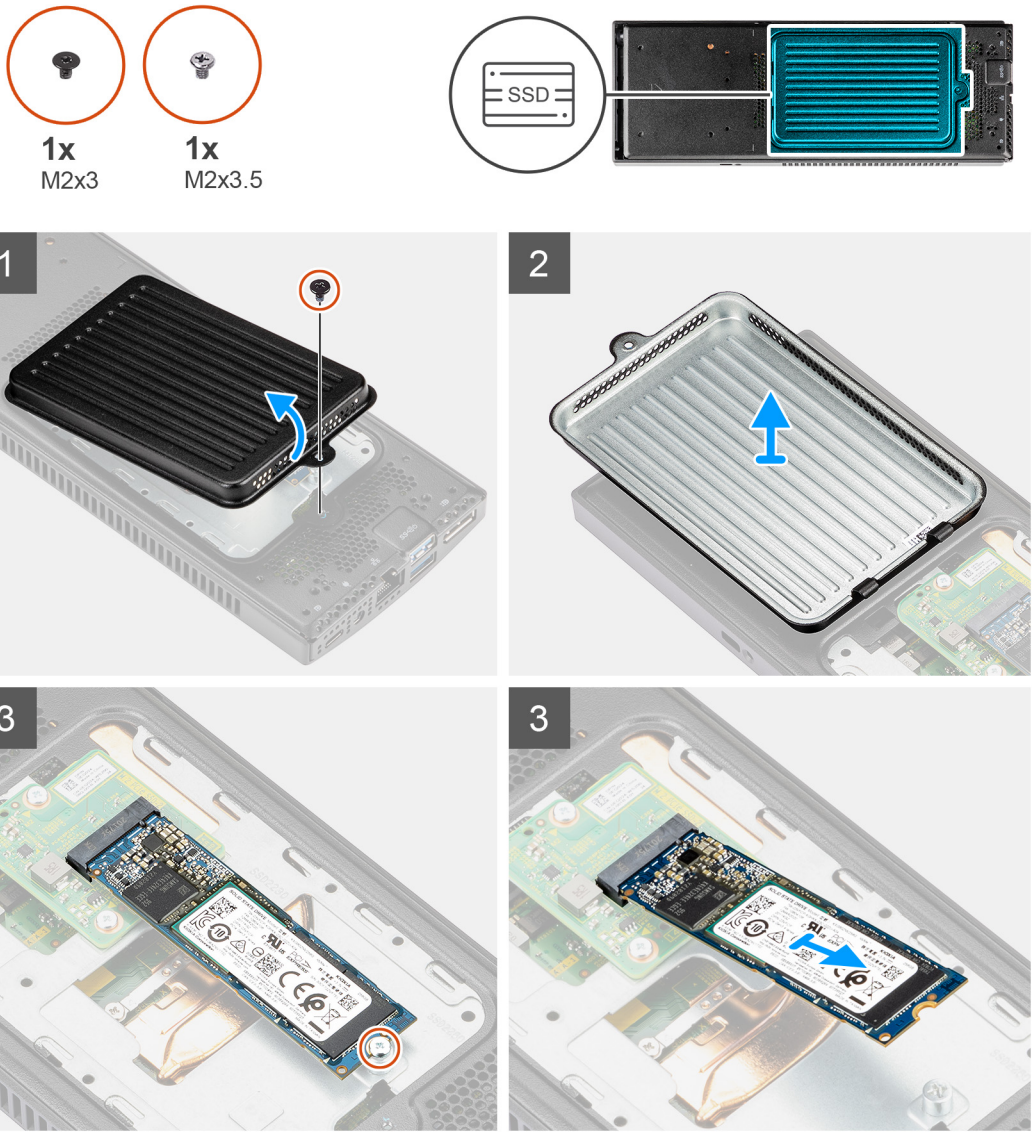
For systems with solid-state drive in the hard drive bay will not support hard drive.

Prerequisites

1. Follow the procedure in before working inside your device.
2. Remove the device from fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.

About this task

The figure indicates the location of the M.2 2280 solid-state drive and provides a visual representation of the removal procedure.



Steps

1. Remove the (M2x3) screw that secures the solid-state drive cover to the chassis.
2. Turn the solid-state drive cover and remove it from the chassis to access the M.2 2280 solid-state drive.
3. Remove the (M2x3.5) screw to that secures the M.2 2280 solid-state drive to the chassis.
4. Lift and remove the M.2 2280 solid-state drive from the solid-state drive slot on the daughter board.

Installing the M.2 2280 solid-state drive

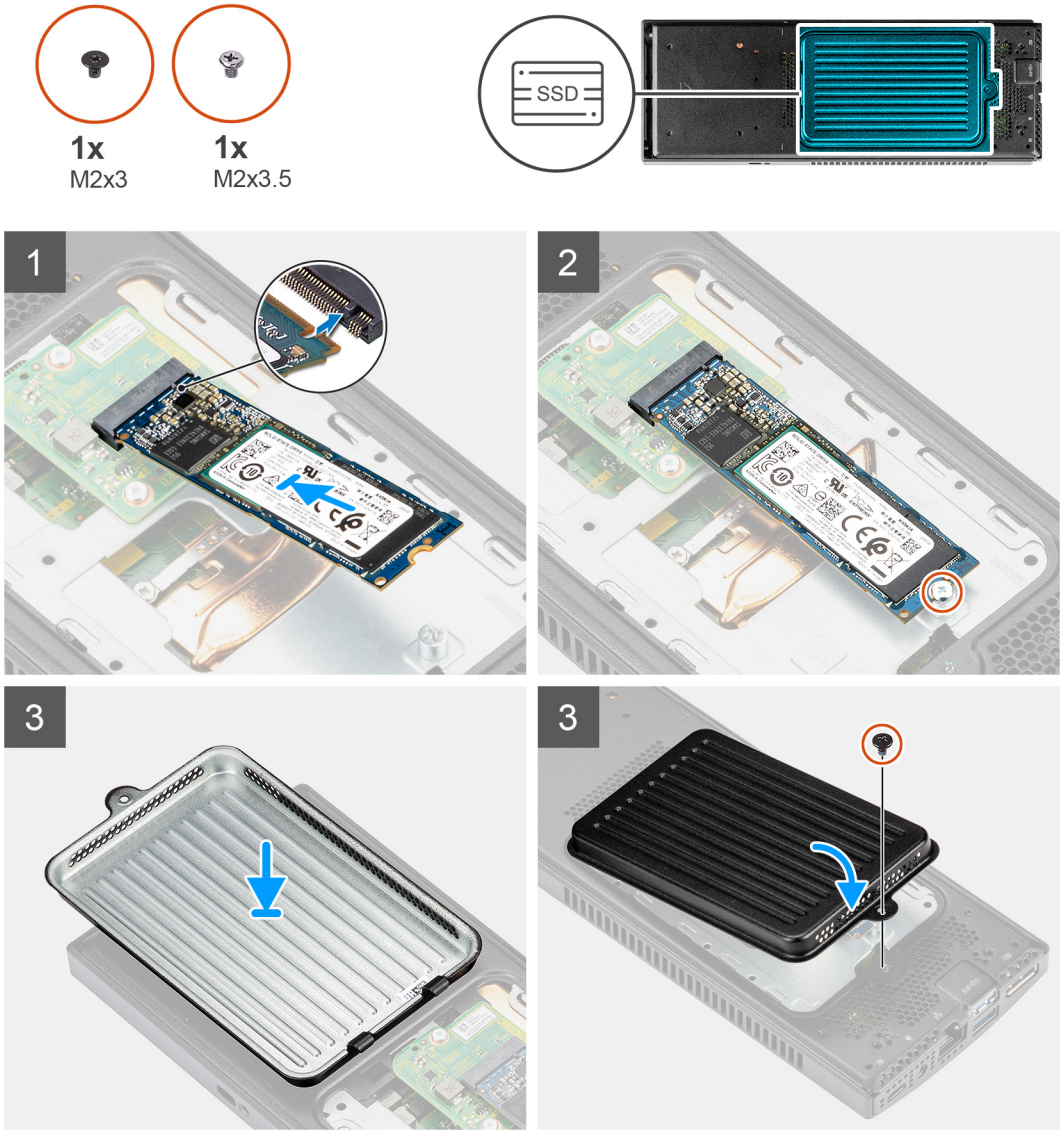
For systems with solid-state drive in the hard drive bay will not support hard drive.

Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The figure indicates the location of the M.2 2280 solid-state drive and provides a visual representation of the installation procedure.



Steps

1. Align the notch on the M.2 2280 solid-state drive with the tab on the daughter board and slide the M.2 2280 solid-state drive at an angle into the slot.
2. Replace the (M2x3.5) screw to secure the M.2 2280 solid-state drive to the chassis.
3. Turn the solid-state drive cover and align the tabs on the solid-state cover with the slots on the chassis.
4. Align the screw hole on the solid-state drive cover with the screw hole on the chassis.
5. Replace the M2x3 screw to secure the solid-state drive cover to the chassis.

Next steps

1. Install the device on Fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
2. Follow the procedure in after working on your device.

Solid-state drive daughter board

For systems with solid-state drive in the hard drive module will not support hard drive.

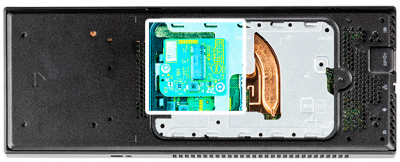
Removing the daughter board

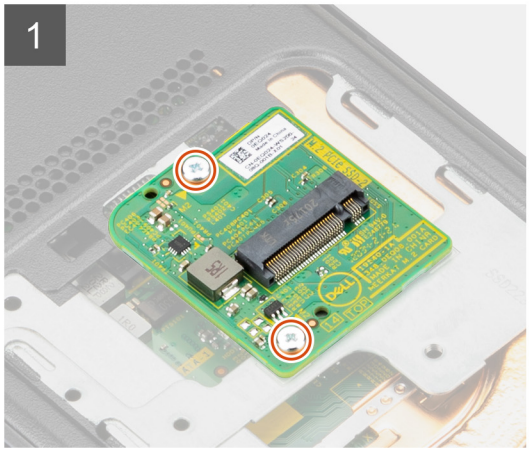
Prerequisites

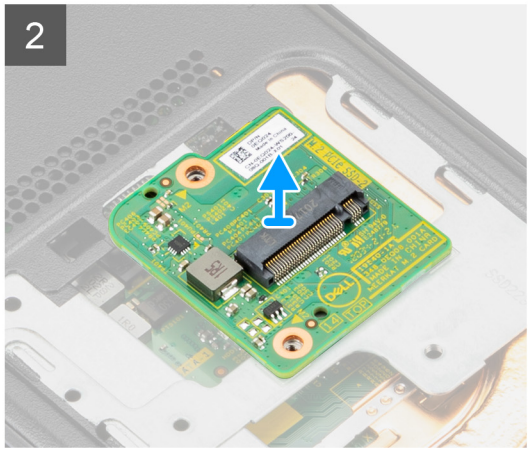
1. Follow the procedure in before working inside your device.
2. Remove the device from fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
3. Remove the solid-state drive in the hard drive bay:
   - M.2 2230 solid-state drive or
   - M.2 2280 solid-state drive

About this task

The figure indicates the location of the daughter board and provides a visual representation of the removal procedure.







Steps

1. Remove the two (M2x3.5) screws that secure the solid-state drive daughter board to the chassis.
2. Disconnect the solid-state drive daughter board from the connector in the system board and lift it from the chassis.

Installing the solid-state drive daughter board

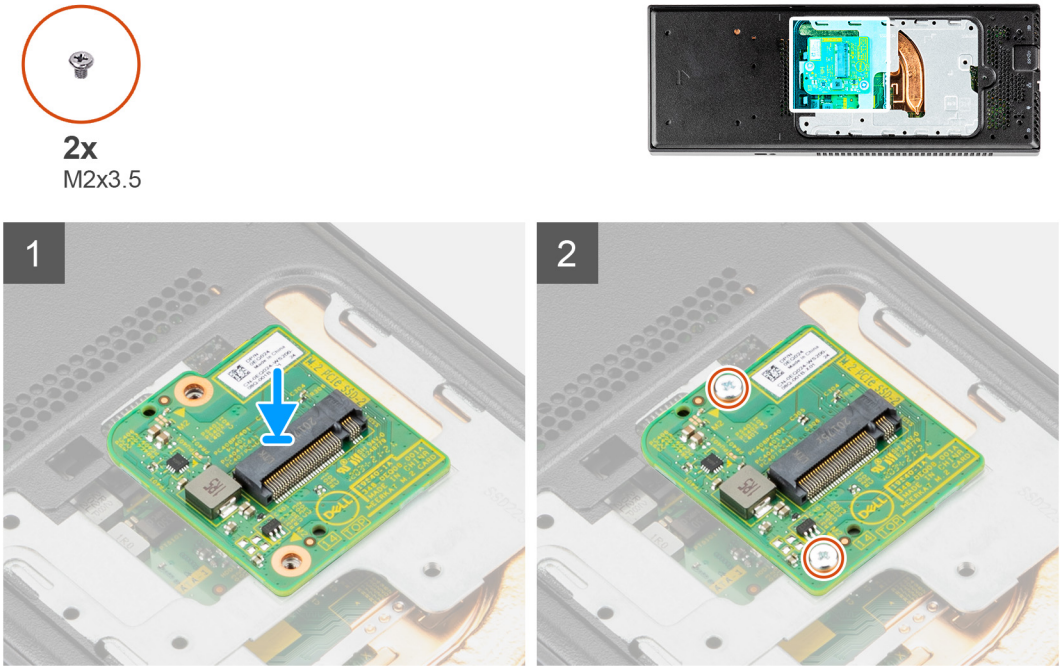
For systems with solid-state drive in the hard drive bay will not support the hard drive.

Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The figure indicates the location of the solid-state drive daughter board and provides a visual representation of the installation procedure.



Steps

1. Align the screw holes on the daughter board with the screw holes on the chassis.
2. Press to connect the solid-state drive daughter board to the connector on the system board.
3. Replace the (M2x3.5) screws to secure the daughter board on the chassis.

Next steps

1. Install the solid-state drive in the hard drive bay:
   - M.2 2230 solid-state drive or
   - M.2 2280 solid-state drive
2. Install the device on Fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
3. Follow the procedure in after working on your device.

Cover

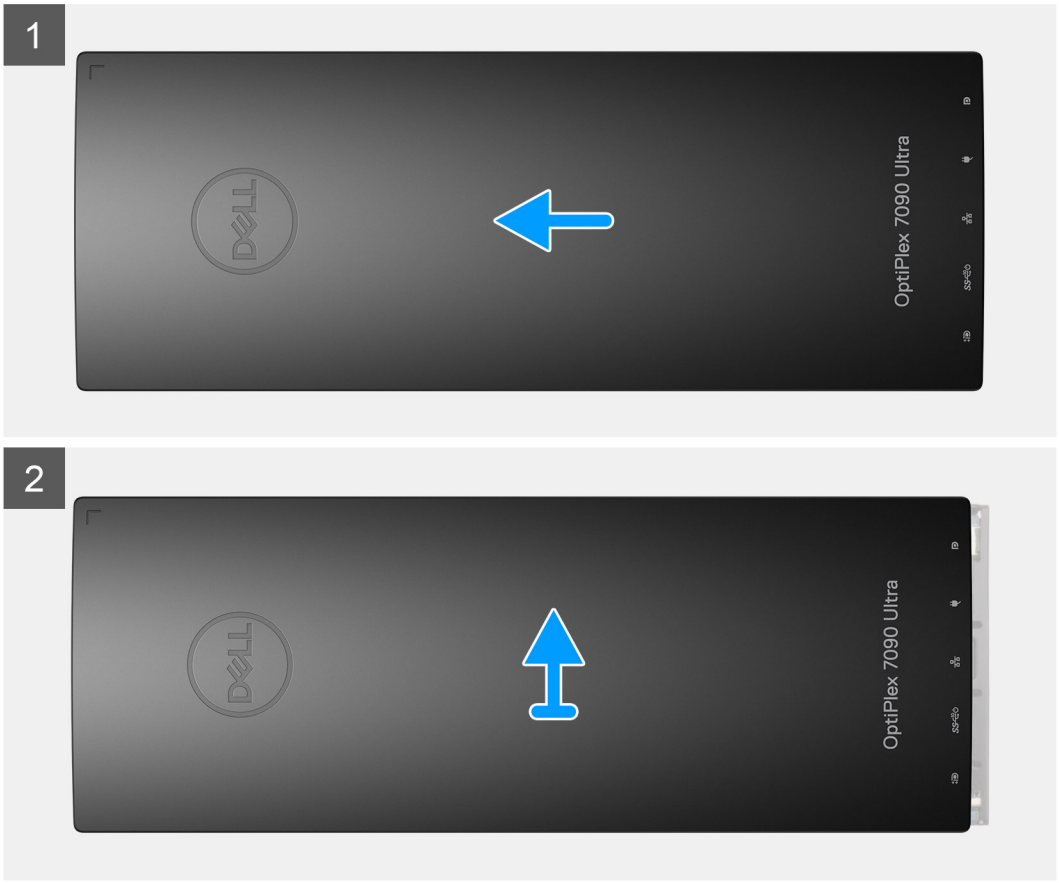
Removing the cover

Prerequisites

1. Follow the procedure in before working inside your device.
2. Remove the device from fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.

About this task

The figure indicates the location of the cover and provides a visual representation of the removal procedure.



Steps

Slide and lift the cover to release it from the chassis.

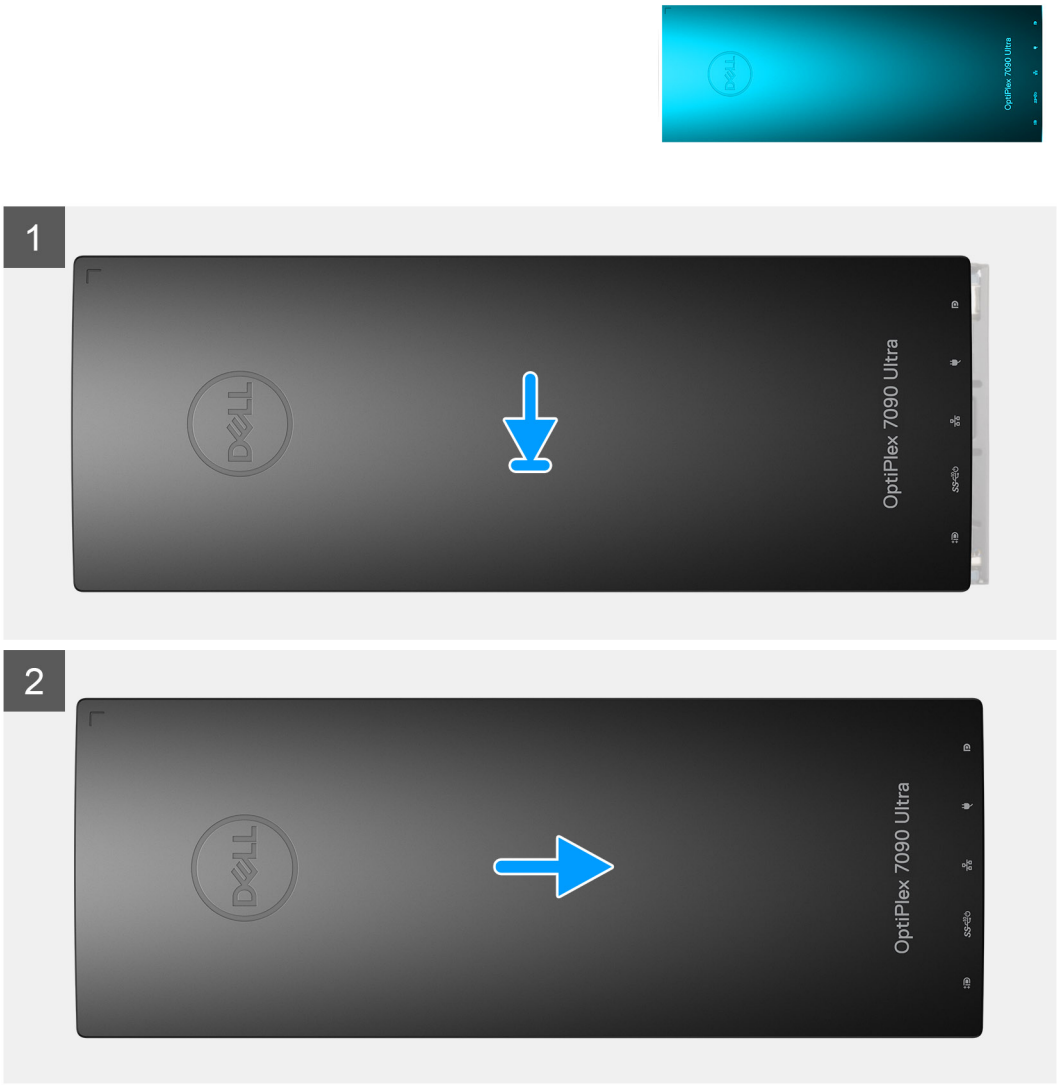
Installing the cover

Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The figure indicates the location of the cover and provides a visual representation of the installation procedure.



Steps

1. Align the tabs on the cover with the slots on the chassis.
2. Slide the cover until it clicks into place.

Next steps

1. Install the device on Fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
2. Follow the procedure in after working on your device.

Memory module

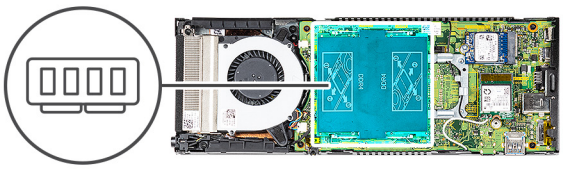
Removing the memory module

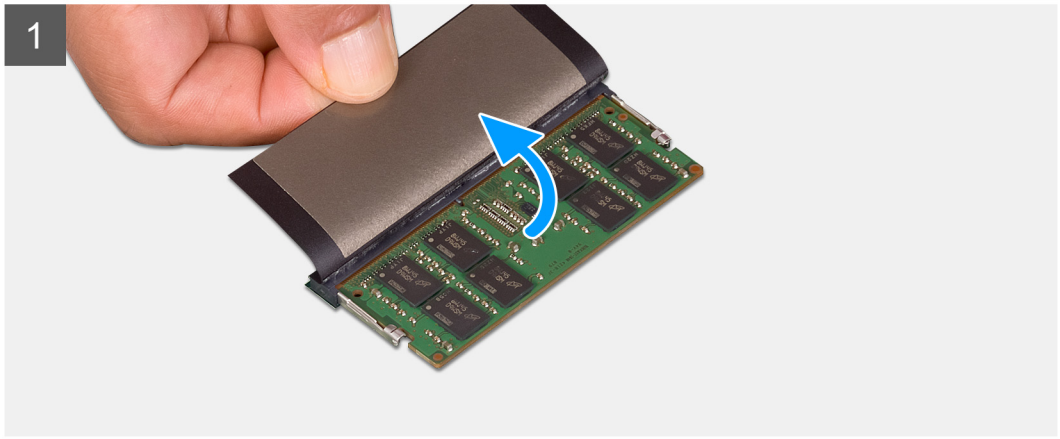
Prerequisites

1. Follow the procedure in before working inside your device.
2. Remove the device from fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
3. Remove the cover.

About this task

The figure indicates the location of the memory module and provides a visual representation of the removal procedure.





Steps

1. Lift the absorber above the memory module.
2. Gently pry the retention clips away from the memory module until the memory module pops up.
3. Slide and remove the memory module from the memory-module slot on the system board.

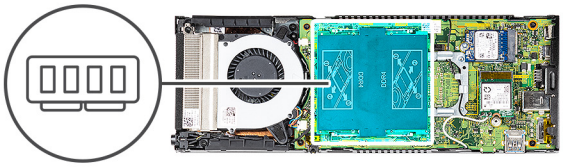
Installing the memory module

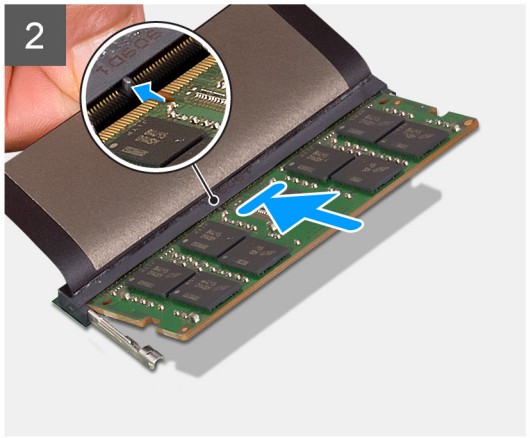
Prerequisites

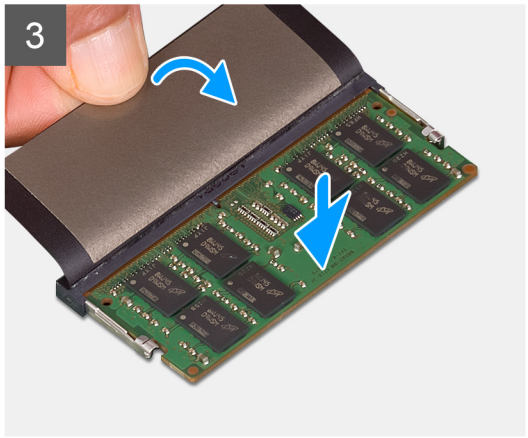
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The figure indicates the location of the memory module and provides a visual representation of the installation procedure.







Steps

1. Lift the absorber above the memory-module slot, and align the notch on the memory module with the tab on the memory-module slot.
2. Slide the memory module firmly into the slot at an angle.
3. Press the memory module down until it clicks into place.

   NOTE: If you do not hear the click, remove the memory module and reinstall it.

4. Lower the absorber above the memory module.

Next steps

1. Install the cover.
2. Install the device on Fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
3. Follow the procedure in after working on your device.

WLAN card

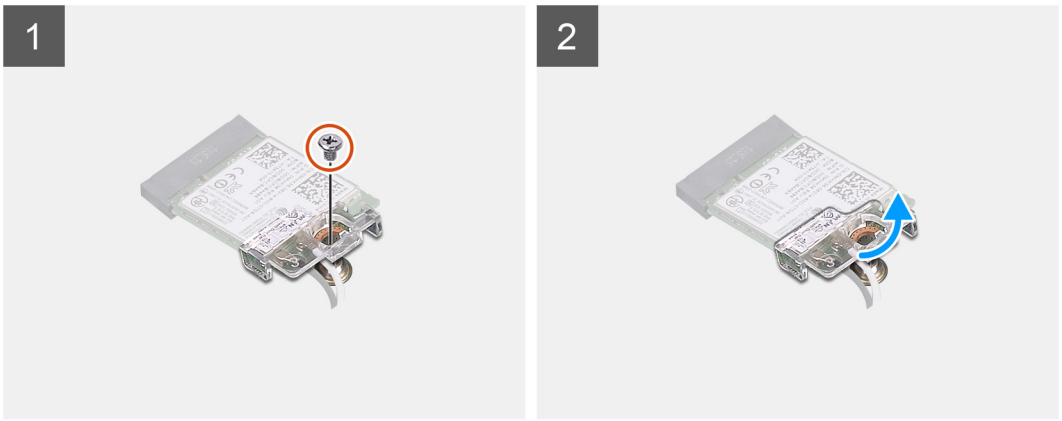
Removing the WLAN card

Prerequisites

1. Follow the procedure in before working inside your device.
2. Remove the device from fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
3. Remove the cover.

About this task

The figure indicates the location of the WLAN card and provides a visual representation of the removal procedure.



Steps

1. Remove the (M2x3.5) screw that secures the WLAN bracket to the system board.
2. Slide and lift the WLAN bracket.
3. Disconnect the WLAN antenna cables from the WLAN card.
4. Lift and slide the WLAN card from the WLAN connector on the system board.

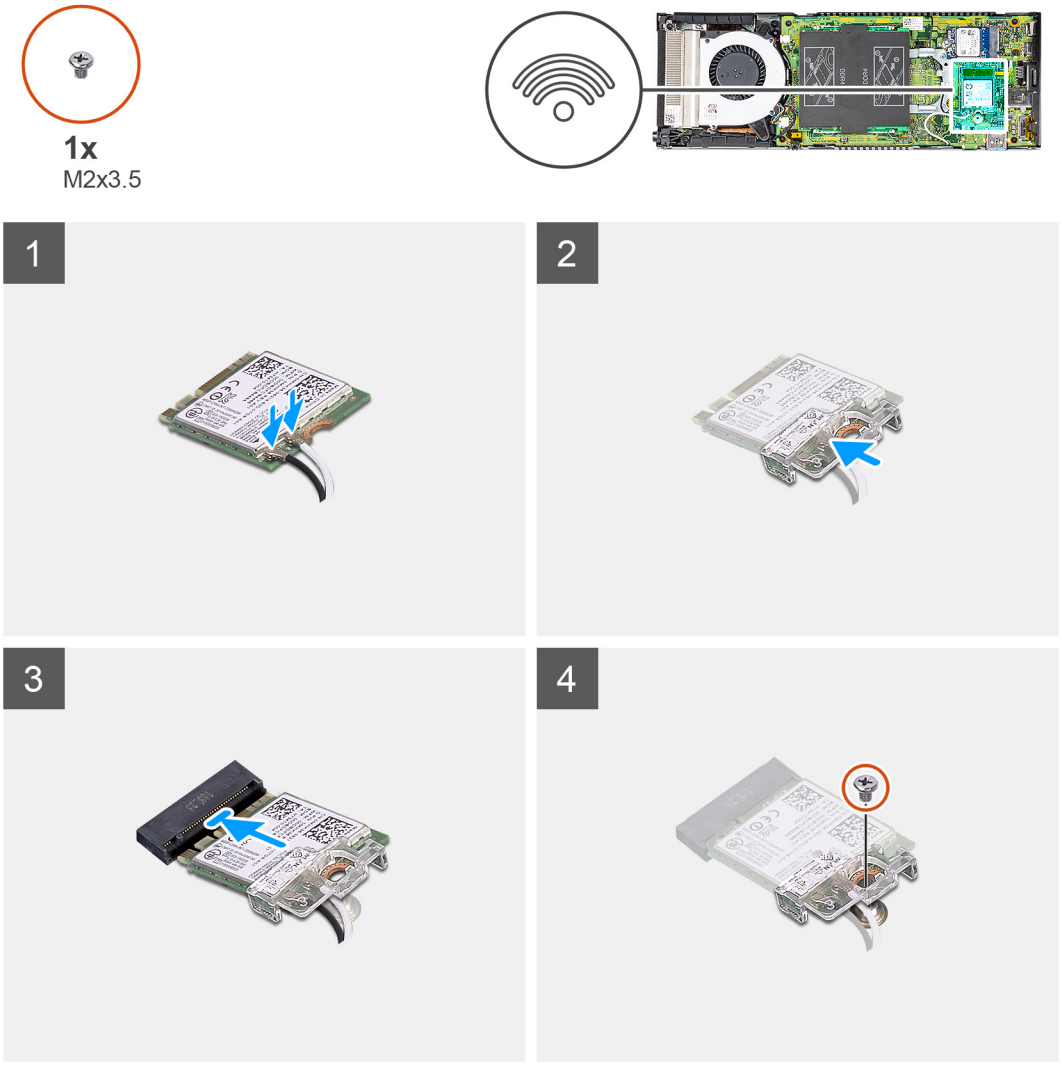
Installing the WLAN card

Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The figure indicates the location of the WLAN card and provides a visual representation of the installation procedure.



Steps

1. Connect the WLAN antenna cables to the WLAN card.
   The following table provides the antenna-cable color scheme for the WLAN card of your computer.

Table 2. Antenna-cable color scheme

Connectors on the wireless card	Antenna-cable color
Main (white triangle)	White
Auxiliary (black triangle)	Black

2. Align and place the WLAN card bracket to secure the WLAN antenna cables to the WLAN card.
3. Align the notch on the WLAN card with the WLAN connector and insert the WLAN card at an angle into the WLAN card slot.
4. Replace the (M2x3.5) screw to secure the WLAN card to the system board.

Next steps

1. Install the cover.
2. Install the device on Fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
3. Follow the procedure in after working on your device.

Internal solid-state drive

Removing the solid-state drive

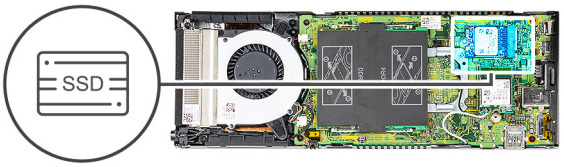
Prerequisites

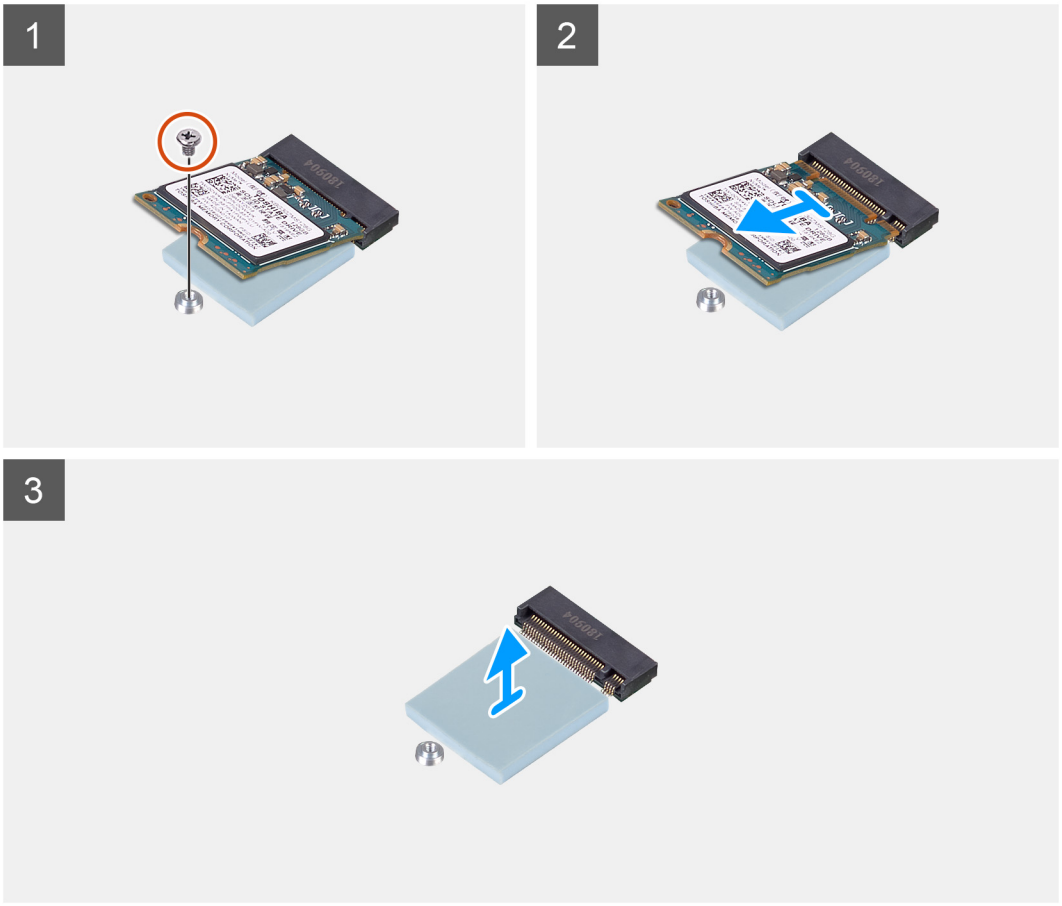
1. Follow the procedure in before working inside your device.
2. Remove the device from fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
3. Remove the cover.

About this task

The figure indicates the location of the M.2 2230 solid-state drive and provides a visual representation of the removal procedure.

1x
M2x3.5





Steps

1. Remove the (M2x3.5) screw that secures the solid-state drive module to the connector on the system board.
2. Lift and slide the solid-state drive module out from the M.2 slot.
3. Peel the solid-state drive thermal pad from the system board.

Installing the solid-state drive

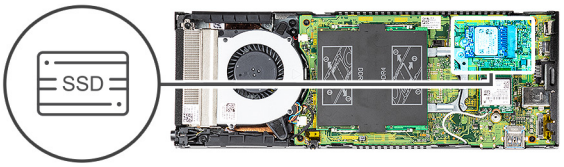
Prerequisites

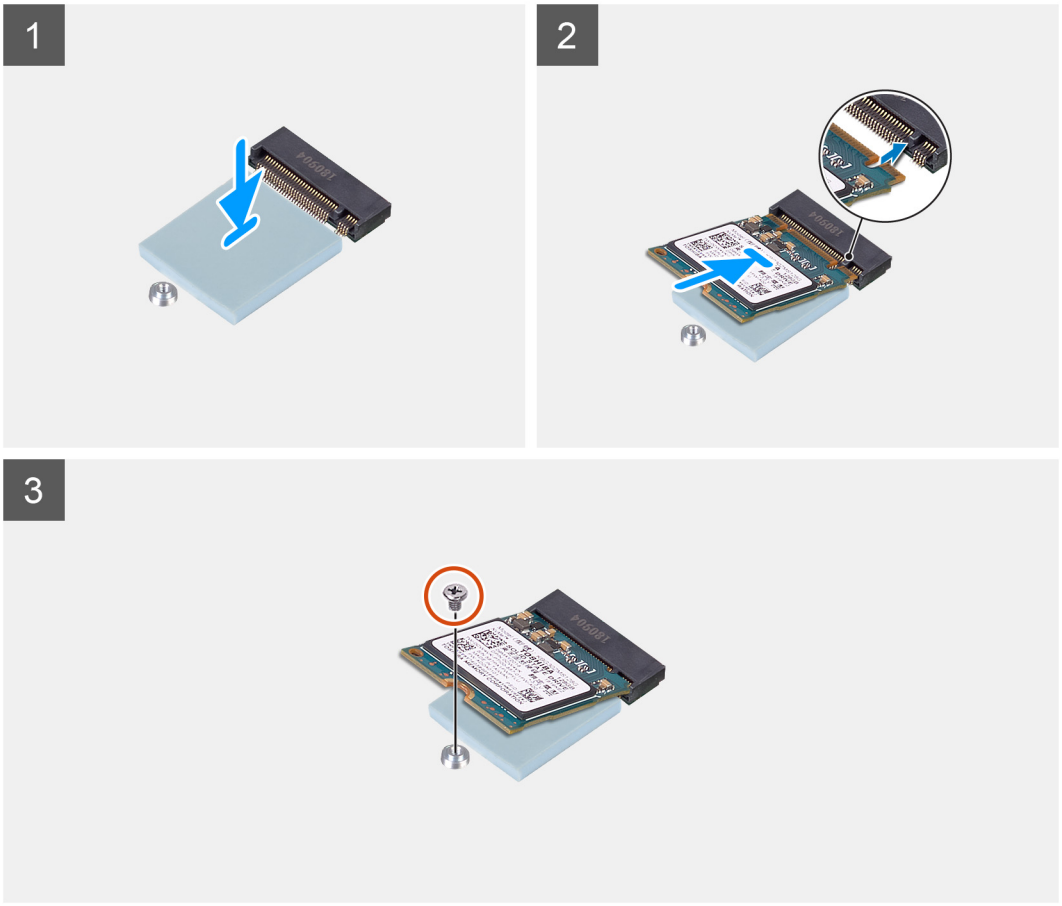
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The figure indicates the location of the M.2 2230 solid-state drive and provides a visual representation of the installation procedure.

1x
M2x3.5





Steps

1. Align and adhere the SSD thermal pad in the mark on the system board.

   NOTE: Check the adhesive direction before adhering it to the system board.

2. Align the notch on the solid-state drive module with the connector on the system board and slide the solid-state drive at an angle into the slot.
3. Replace the (M2x3.5) screw to secure the solid-state drive module to the system board.

Next steps

1. Install the cover.
2. Install the device on Fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
3. Follow the procedure in after working on your device.

eMMC Storage module

For computers with eMMC module in M.2 2230 SSD slot.

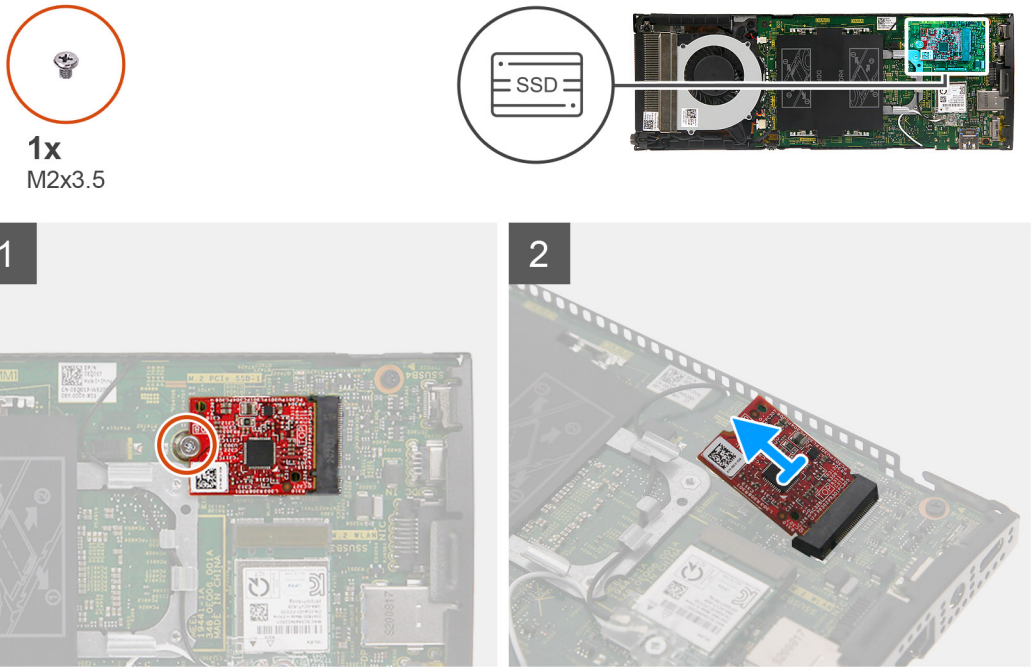
Removing the eMMC storage module

Prerequisites

1. Follow the procedure in before working inside your device.
2. Remove the device from fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
3. Remove the cover.

About this task

The figure indicates the location of the eMMC storage module and provides a visual representation of the removal procedure.



Steps

1. Remove the (M2x3.5) screw that secures the eMMC storage module to the connector on the system board.
2. Lift and slide the eMMC storage module at an angle out from the slot.

Installing the eMMC storage module

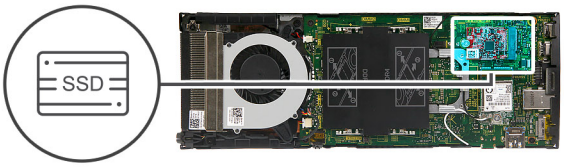
Prerequisites

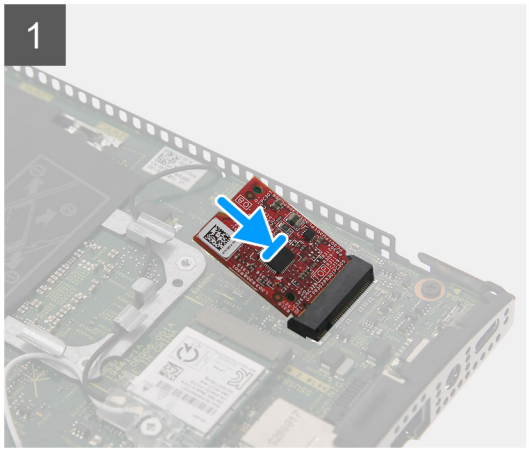
If you are replacing a component, remove the existing component before performing the installation procedure.

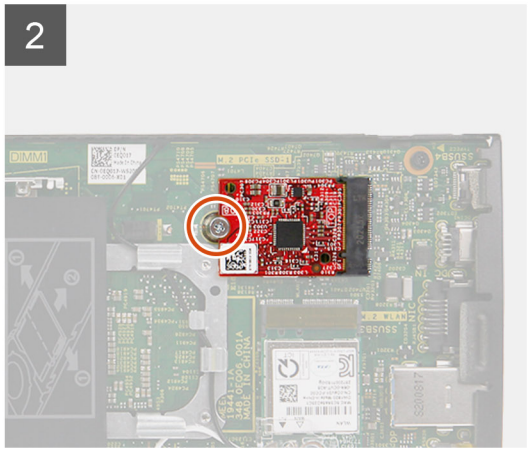
About this task

The figure indicates the location of the eMMC storage module and provides a visual representation of the installation procedure.

1x
M2x3.5







Steps

1. Align the notch on the eMMC storage module with the connector on the system board and slide the eMMC storage module at an angle into the slot.
2. Replace the (M2x3.5) screw to secure the eMMC storage module to the system board.

Next steps

1. Install the cover.
2. Install the device on Fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
3. Follow the procedure in after working on your device.

System fan

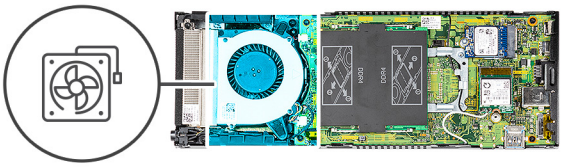
Removing the system fan

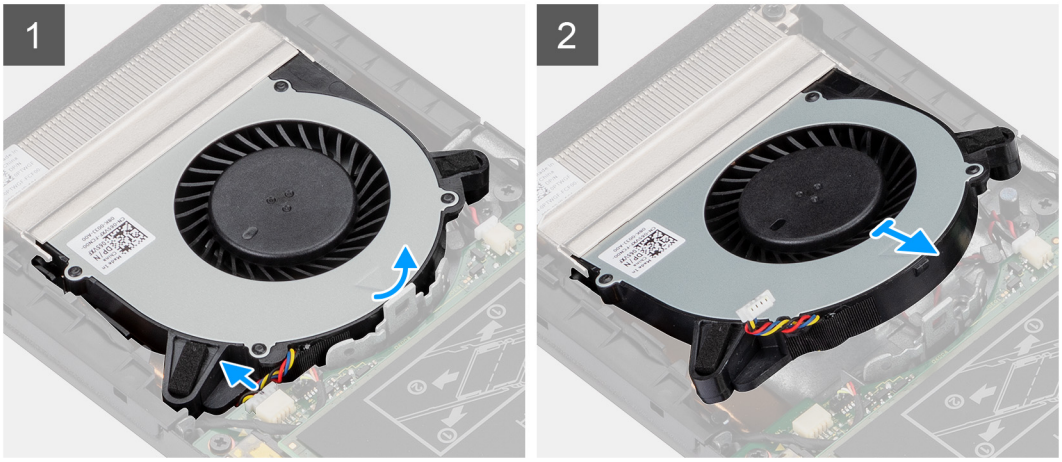
Prerequisites

1. Follow the procedure in before working inside your device.
2. Remove the device from fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
3. Remove the cover.

About this task

The figure indicates the location of the system fan and provides a visual representation of the removal procedure.





Steps

1. Release the system fan from the retention tab on the fan tray.
2. Disconnect the system fan cable from the connector on the system board.
3. Slide the system fan out from the guiding rails on the heat-sink bracket.

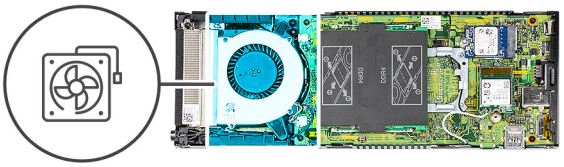
Installing the system fan

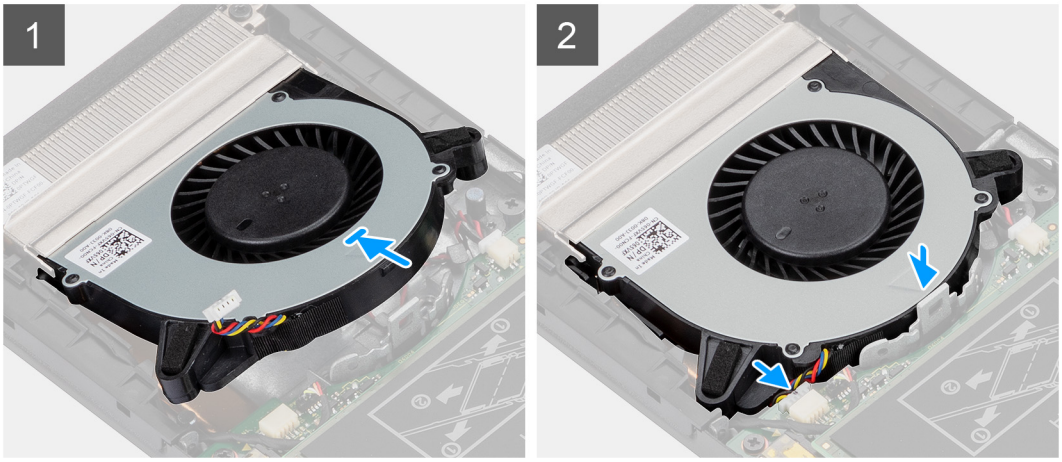
Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The figure indicates the location of the system fan and provides a visual representation of the installation procedure.





Steps

1. Connect the system fan cable to the connector on the system board.
2. Align the tabs on the system fan with the guiding rails on the heat-sink bracket.
3. Press the system fan down into the fan tray until it clicks into place.

Next steps

1. Install the cover.
2. Install the device on Fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
3. Follow the procedure in after working on your device.

Power button

Removing the power button

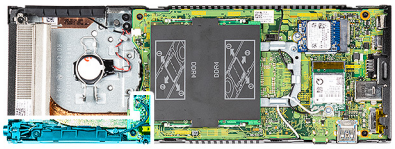
Prerequisites

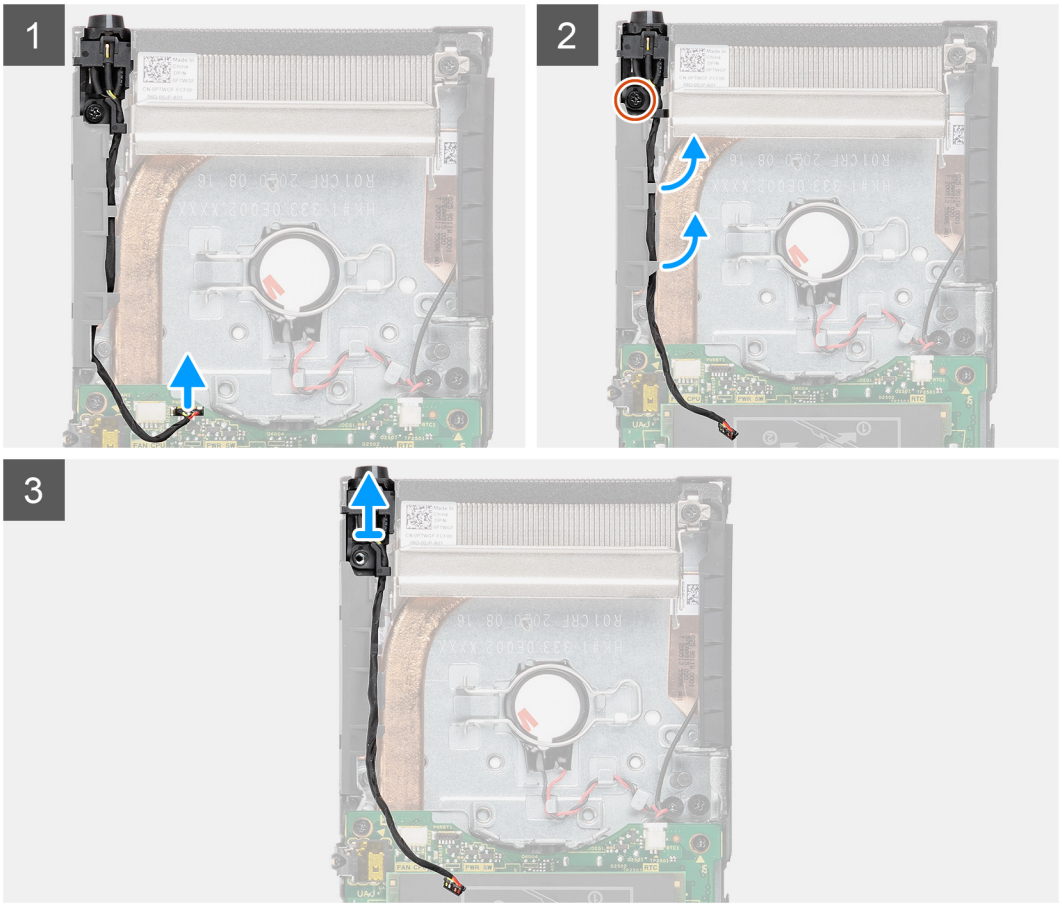
1. Follow the procedure in before working inside your device.
2. Remove the device from fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
3. Remove the cover.
4. Remove the system fan.

About this task

The figure indicates the location of the power button and provides a visual representation of the removal procedure.

1x
M2x3





Steps

1. Disconnect the power-button cable from the connector on the system board.
2. Unroute the power-button cable from the routing guide.

   NOTE: Observe the routing of the power-button cable inside the chassis as you remove them. Route the cable properly when you replace the component to prevent the cable from being pinched or crimped.

3. Remove the (M2x3) screw that secures the power button to the chassis.
4. Lift the power button out of the chassis.

Installing the power button

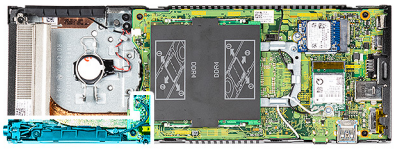
Prerequisites

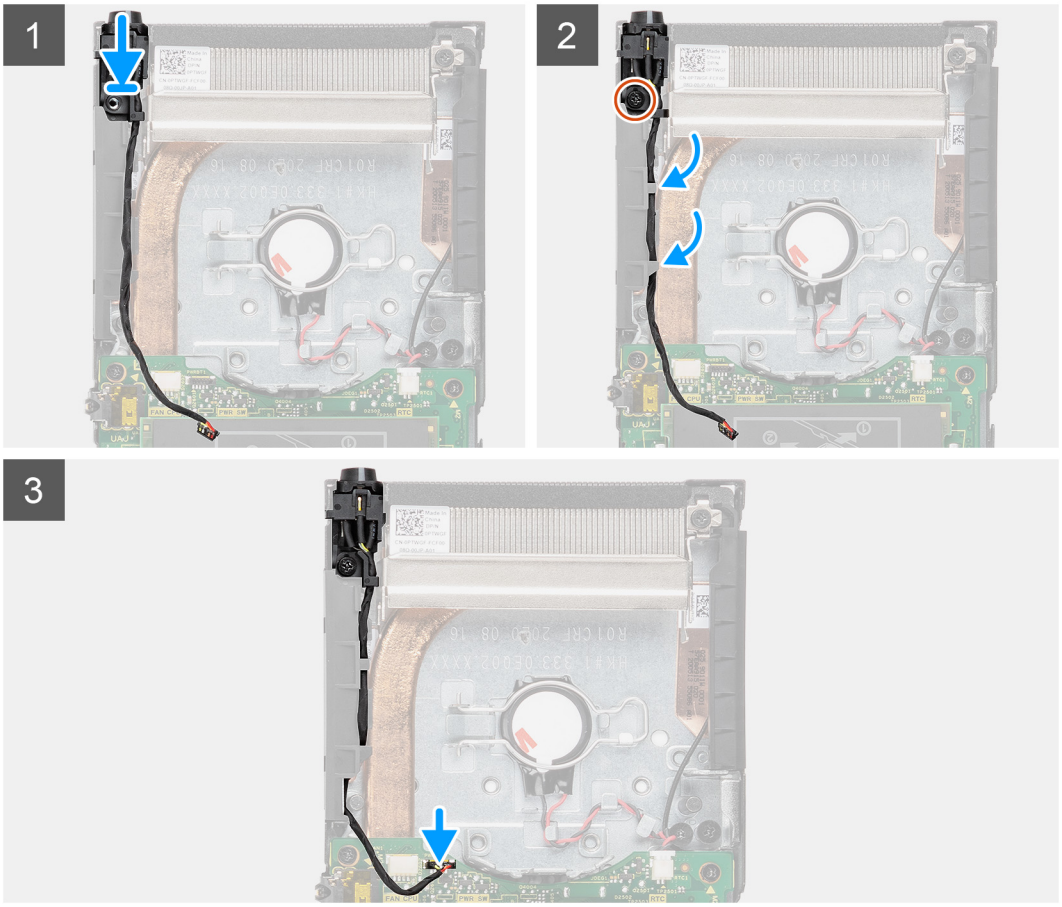
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The figure indicates the location of the power button and provides a visual representation of the installation procedure.

1x
M2x3





Steps

1. Place the power button into the slot on the chassis.
2. Replace the (M2x3) screw to secure the power button to the chassis.
3. Route the power button cable through the routing guides on the chassis.
4. Connect the power-button cable to the connector on the system board.

Next steps

1. Install the system fan.
2. Install the cover.
3. Install the device on Fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
4. Follow the procedure in after working on your device.

Coin-cell battery

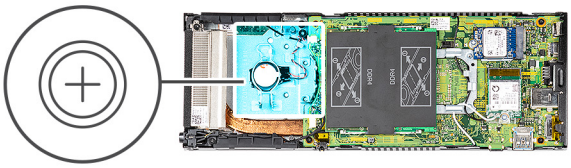
Removing the coin-cell battery

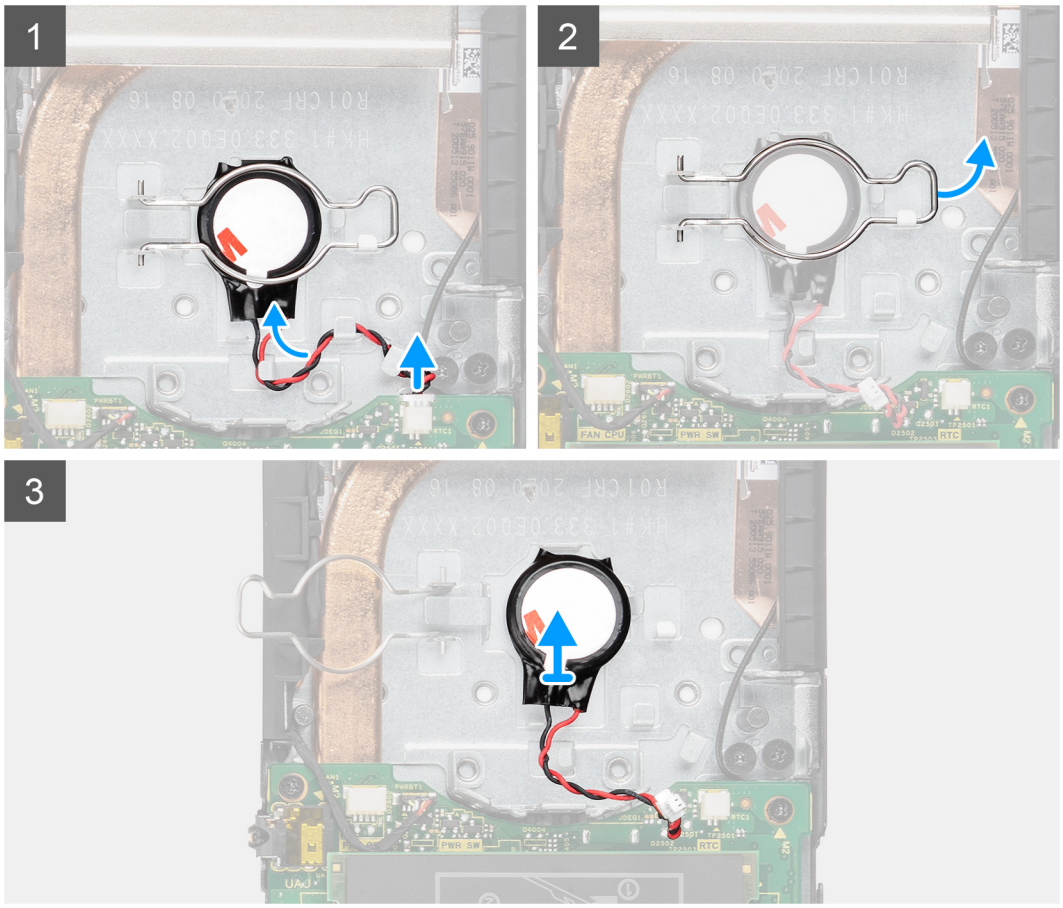
Prerequisites

1. Follow the procedure in before working inside your device.
2. Remove the device from fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
3. Remove the cover.
4. Remove the system fan.

About this task

The figure indicates the location of the coin-cell battery and provides a visual representation of the removal procedure.





Steps

1. Disconnect the coin-cell battery cable from the connector on the system board.
2. Unroute the coin-cell battery cable from the routing guide.

NOTE: Observe the routing of the coin-cell battery cable inside the chassis as you remove them. Route the cable properly when you replace the component to prevent the cable from being pinched or crimped.

3. Release the coin-cell retention clip from the securing hook and turn the clip to the other side to access the coin-cell battery.
4. Lift the coin-cell battery.

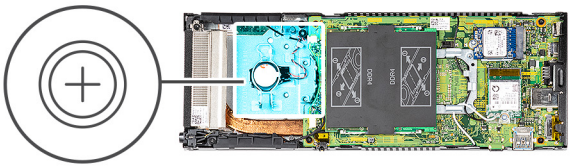
Installing the coin-cell battery

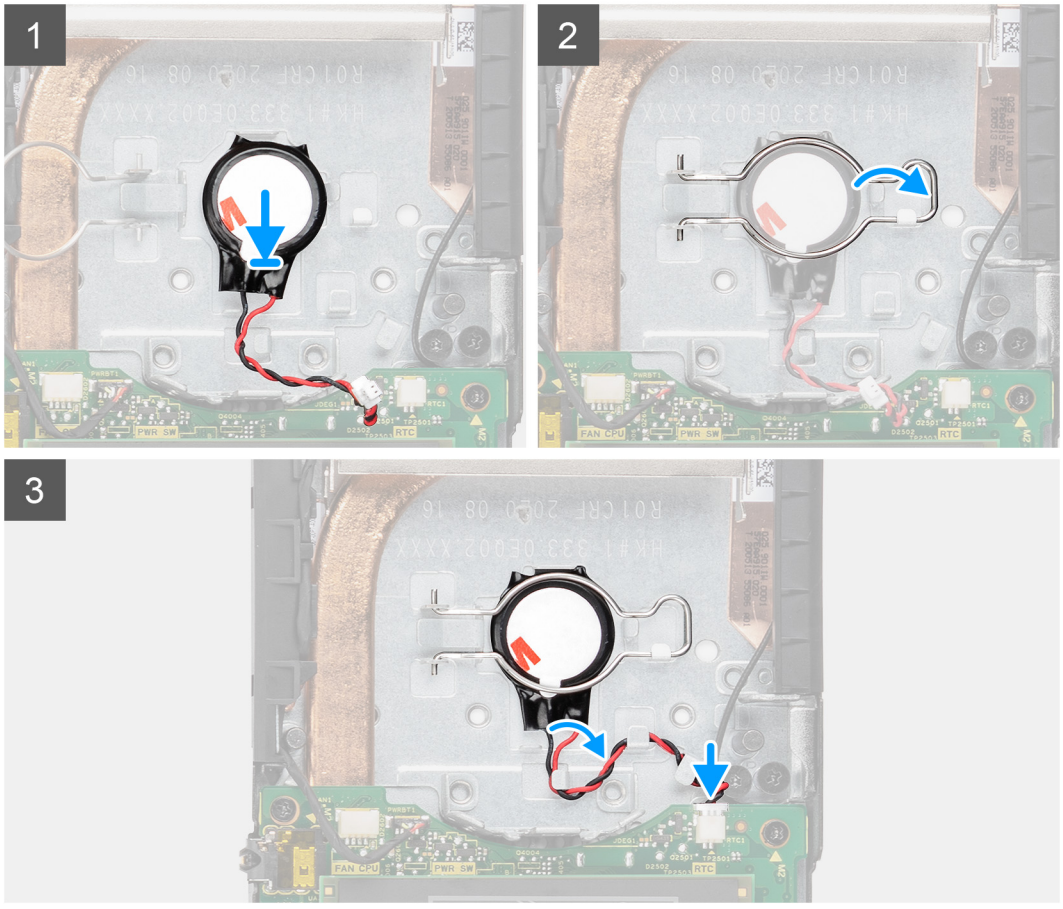
Prerequisites

If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The figure indicates the location of the coin-cell battery and provides a visual representation of the installation procedure.





Steps

1. Place the coin-cell battery in the slot on the chassis.
2. Close the coin-cell retention clip to secure the coin-cell battery.
3. Secure the coin-cell retention clip to the hook.

4. Route the coin-cell battery cable through the routing guide.
5. Connect the coin-cell battery cable to the connector on the system board.

Next steps

1. Install the system fan.
2. Install the cover.
3. Install the device on Fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
4. Follow the procedure in after working on your device.

System board

Removing the system board

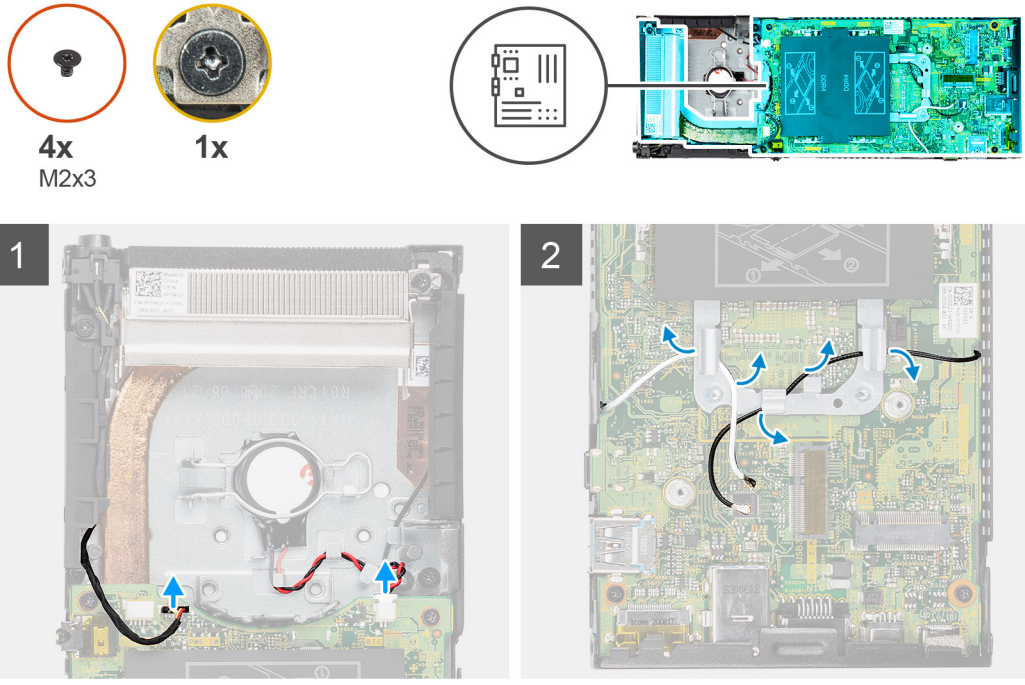
Prerequisites

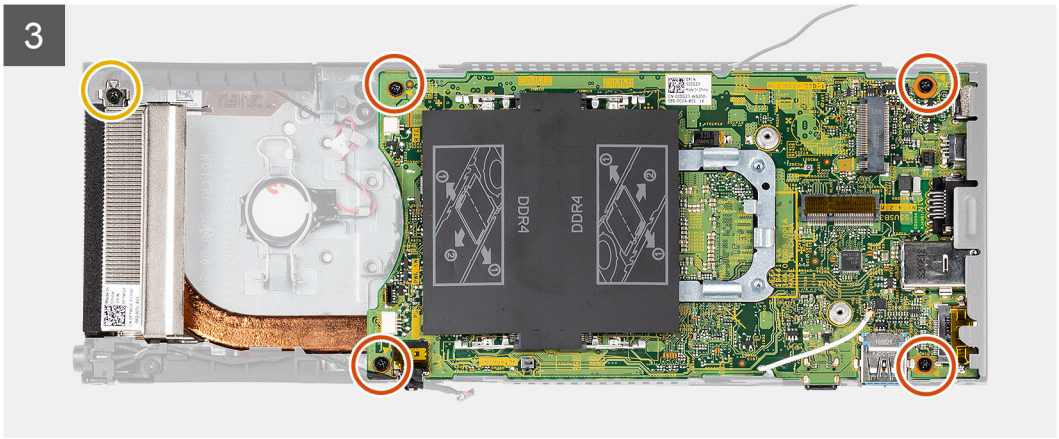
1. Follow the procedure in before working inside your device.
2. Remove the device from fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
3. Remove the hard-drive assembly.

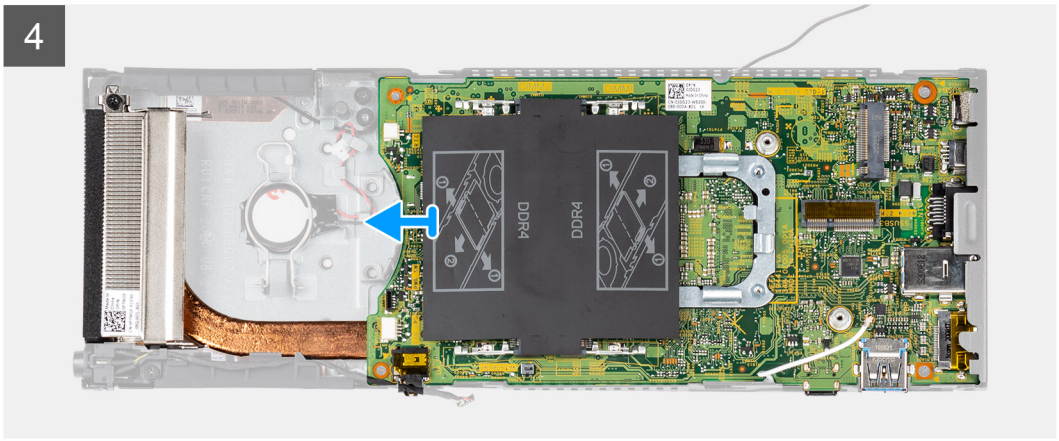
   NOTE: For systems configured with solid-state drive in the hard-drive bay
   - Remove the M.2 2280 solid-state drive/M.2 2230 solid-state drive.
   - Remove the solid-state drive daughter board.
4. Remove the cover.
5. Remove the system fan.
6. Remove the WLAN card.
7. Remove the solid-state drive.
8. Remove the memory module.

About this task

The figure indicates the location of the system board and provides a visual representation of the removal procedure.







Steps

1. Disconnect the power-button cable and the coin-cell battery cable from the connectors on the system board.
2. Unroute the power-button cable and the coin-cell battery cable from the routing guides.
3. Unroute the WLAN antenna cables from the routing guides.

   NOTE: Observe the routing of the WLAN antenna cables inside the chassis as you remove them. Route these cables properly when you replace the component to prevent the cables from being pinched or crimped.

4. Loosen the (M2x3) captive screw and remove the four (M2x3) screws that secure the system board to the chassis.
5. Slightly lift and slide the system board out of the chassis.

   NOTE: The system board is removed along with the heat-sink connected to it.

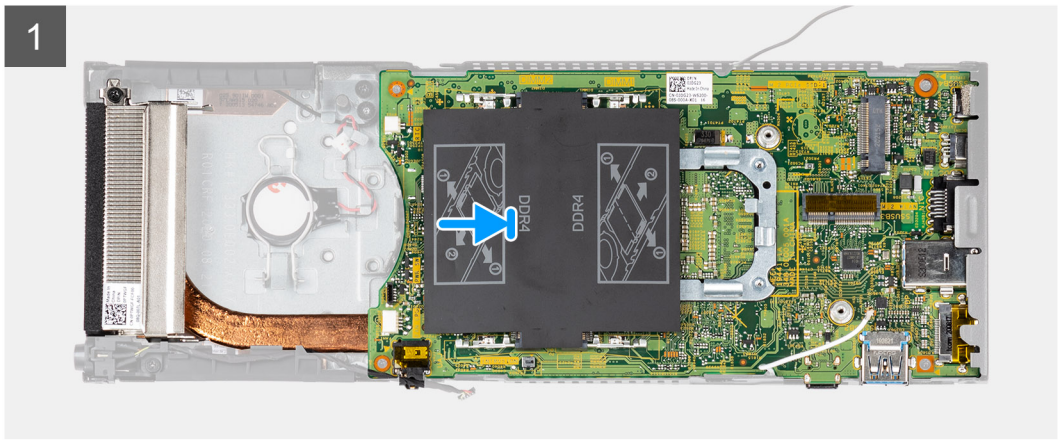
Installing the system board

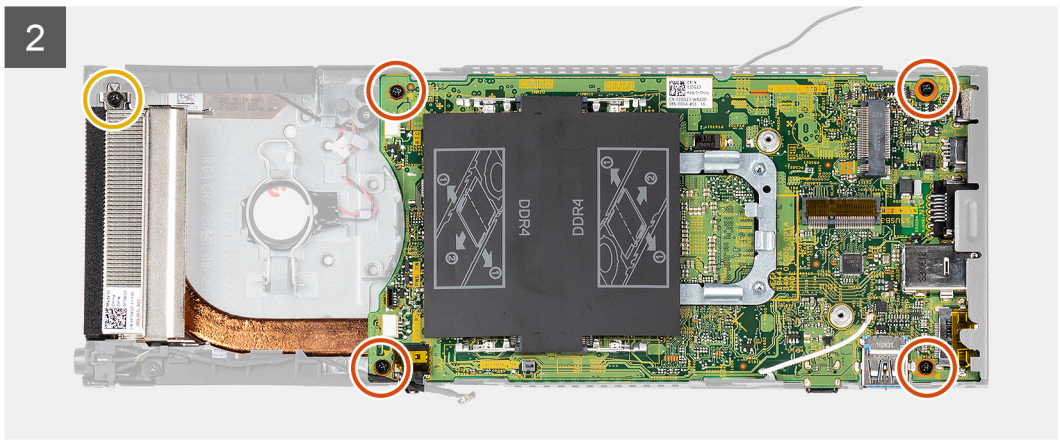
Prerequisites

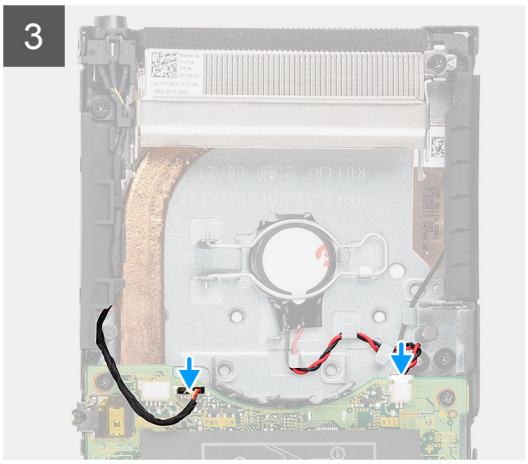
If you are replacing a component, remove the existing component before performing the installation procedure.

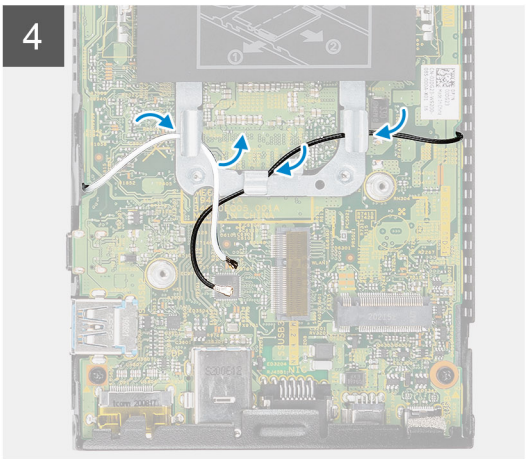
About this task

The figure indicates the location of the system board and provides a visual representation of the installation procedure.









Steps

1. Align the connectors on the system board with the connector slots on the chassis.

   NOTE: The system board is installed along with the heat-sink connected to it.

2. Gently slide the system board into the chassis.

3. Tighten the (M2x3) captive screw and replace the four (M2x3) screws to secure the system board to the chassis.
4. Route the power-button cable and the coin-cell battery cable through the routing guides.
5. Connect the power-button cable and the coin-cell battery cable to the connectors on the system board.
6. Route the WLAN antenna cables through the routing guides.

   NOTE: The antennas should be aligned with the notches in the system board and the cable routing should not be over the system board QR code.

Next steps

1. Install the solid-state drive.
2. Install the memory module.
3. Install the WLAN card.
4. Install the system fan.
5. Install the cover.
6. Install the hard-drive assembly.

   NOTE: For systems configured with solid-state drive in the hard-drive bay

   - Install the daughter board.
   - Install the M.2 2280 solid-state drive/M.2 2230 solid-state drive.
7. Install the device on Fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
8. Follow the procedure in after working on your device.

Heat-sink

Removing the heat-sink

Prerequisites

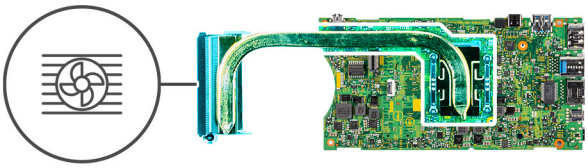
1. Follow the procedure in before working inside your device.
2. Remove the device from fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
3. Remove the hard-drive assembly.

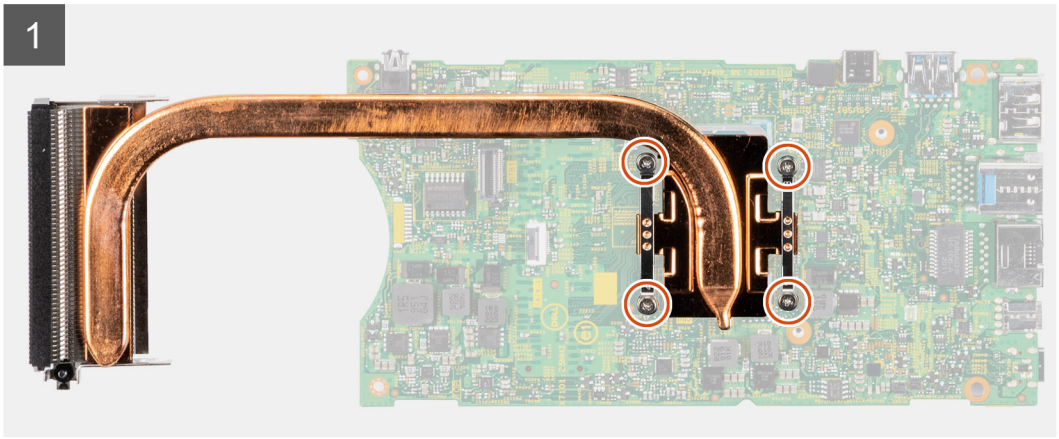
   NOTE: For systems configured with solid-state drive in the hard-drive bay

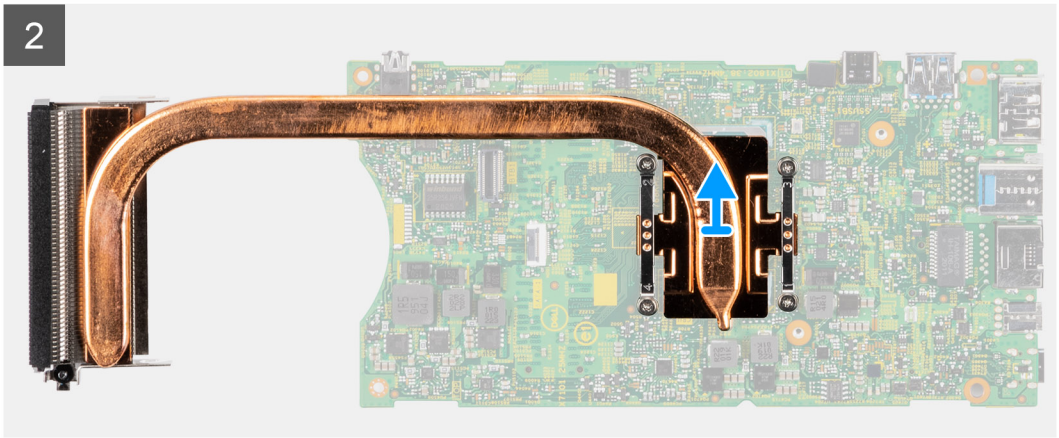
   - Remove the M.2 2280 solid-state drive/M.2 2230 solid-state drive.
   - Remove the solid-state drive daughter board.
4. Remove the cover.
5. Remove the system fan.
6. Remove the WLAN card.
7. Remove the solid-state drive.
8. Remove the memory module.
9. Remove the system board.

About this task

The figure indicates the location of the heat-sink assembly and provides a visual representation of the removal procedure.







Steps

1. In sequential order (as indicated on the heat sink), loosen the four captive screws that secure the heat sink to the system board.
2. Lift the heat-sink away from the system board.

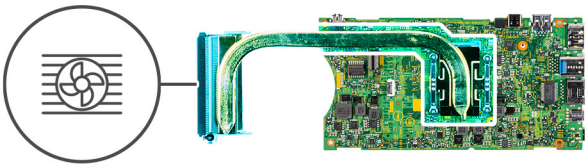
Installing the heat-sink

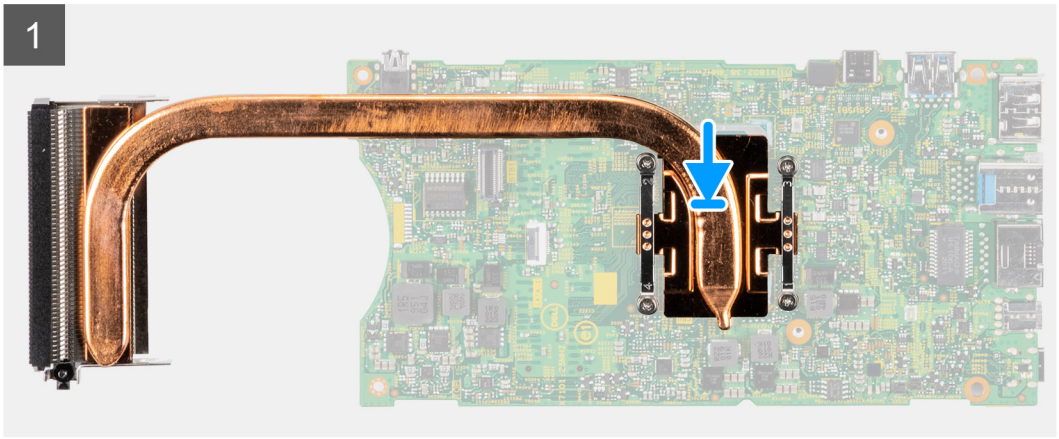
Prerequisites

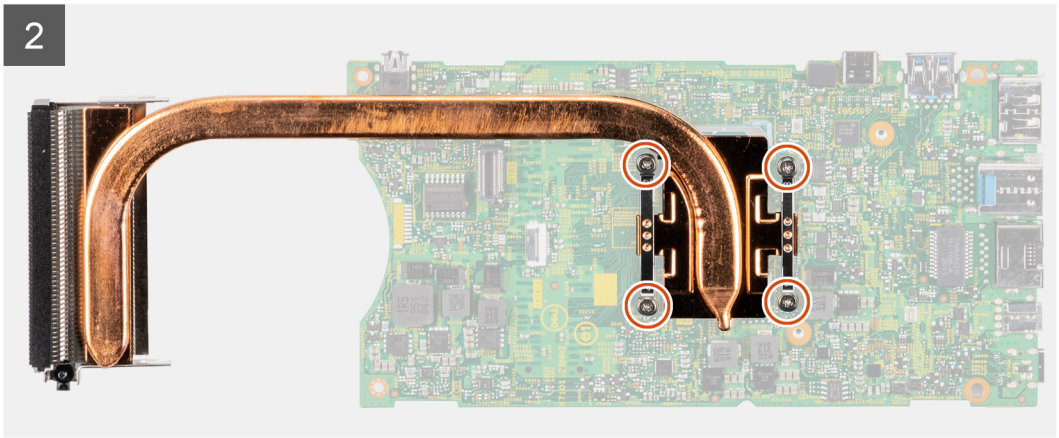
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The figure indicates the location of the heat-sink and provides a visual representation of the installation procedure.







Steps

1. Align the screws on the heat-sink with the screw holes on the system board.
2. In sequential order (as indicated on the heat sink), tighten the four captive screws that secure the heat sink to the system board.

Next steps

1. Install the system board.
2. Install the solid-state drive
3. Install the memory module.
4. Install the WLAN card.
5. Install the system fan.
6. Install the cover.
7. Install the hard-drive assembly.

   NOTE: For systems configured with solid-state drive in the hard-drive bay

   - Install the daughter board.
   - Install the M.2 2280 solid-state drive in hard-drive bay/M.2 2230 solid-state drive in hard-drive bay.
8. Install the device on Fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
9. Follow the procedure in after working on your device.

Replacing the chassis

Prerequisites

1. Follow the procedure in before working inside your device.
2. Remove the device from fixed stand/Pro 1 height-adjustable stand/Offset VESA mount/Pro 2 height-adjustable stand/Wall mount.
3. Remove the hard-drive assembly.

   NOTE: For systems with solid-state drive module in hard-drive bay

   - Remove the M.2 2280 solid-state drive in hard-drive bay/M.2 2230 solid-state drive in hard-drive bay.
   - Remove the daughter board.
4. Remove the cover.
5. Remove the system fan.
6. Remove the WLAN card.
7. Remove the solid-state drive.
8. Remove the power button
9. Remove the memory module.
10. Remove the coin-cell battery.
11. Remove the system board.

About this task

After removing the above components, we are left with the chassis.

4

Software

This chapter details the supported operating systems along with instructions on how to install the drivers.

Topics:

- Drivers and downloads

Drivers and downloads

When troubleshooting, downloading or installing drivers it is recommended that you read the Dell Knowledge Based article, Drivers and Downloads FAQ 000123347.

5

System setup

CAUTION: Unless you are an expert computer user, do not change the settings in the BIOS Setup program. Certain changes can make your computer work incorrectly.

NOTE: Before you change BIOS Setup program, it is recommended that you write down the BIOS Setup program screen information for future reference.

Use the BIOS Setup program for the following purposes:

- Get information about the hardware installed in your computer, such as the amount of RAM and the size of the hard drive.
- Change the system configuration information.
- Set or change a user-selectable option, such as the user password, type of hard drive installed, and enabling or disabling base devices.

Topics:

BIOS overview

The BIOS manages data flow between the computer's operating system and attached devices such as hard disk, video adapter, keyboard, mouse, and printer.

Entering BIOS setup program

About this task

Turn on (or restart) your computer and press F2 immediately.

Boot menu

Press <F12> when the Dell logo appears to initiate a one-time boot menu with a list of the valid boot devices for the system. Diagnostics and BIOS Setup options are also included in this menu. The devices listed on the boot menu depend on the bootable devices in the system. This menu is useful when you are attempting to boot to a particular device or to bring up the diagnostics for the system. Using the boot menu does not make any changes to the boot order stored in the BIOS.

The options are:

- UEFI Boot:
  - Windows Boot Manager
- Other Options:
  - BIOS Setup
  - BIOS Flash Update
  - Diagnostics
  - Change Boot Mode Settings

Navigation keys

NOTE: For most of the System Setup options, changes that you make are recorded but do not take effect until you restart the system.

Keys	Navigation
Up arrow	Moves to the previous field.
Down arrow	Moves to the next field.
Enter	Selects a value in the selected field (if applicable) or follow the link in the field.
Spacebar	Expands or collapses a drop-down list, if applicable.
Tab	Moves to the next focus area.
Esc	Moves to the previous page until you view the main screen. Pressing Esc in the main screen displays a message that prompts you to save any unsaved changes and restarts the system.

Boot Sequence

Boot sequence enables you to bypass the System Setup–defined boot device order and boot directly to a specific device (for example: optical drive or hard drive). During the Power-on Self-Test (POST), when the Dell logo appears, you can:

- Access System Setup by pressing F2 key
- Bring up the one-time boot menu by pressing F12 key.

The one-time boot menu displays the devices that you can boot from including the diagnostic option. The boot menu options are:

- Removable Drive (if available)
- STXXXX Drive

  NOTE: XXXX denotes the SATA drive number.
- Optical Drive (if available)
- SATA Hard Drive (if available)
- Diagnostics

  NOTE: Choosing **Diagnostics**, displays the **SupportAssist** screen.

The boot sequence screen also displays the option to access the System Setup screen.

System setup options

NOTE: Depending on your system and its installed devices, the items that are listed in this section may or may not appear.

Table 3. System setup options—System information menu

Overview	
BIOS Version	Displays the BIOS version number.
Service Tag	Displays the Service Tag of the system.
Asset Tag	Displays the Asset Tag of the system.
Manufacture Date	Displays the manufacture date of the system.
Ownership Date	Displays the ownership date of the system.
Express Service Code	Displays the express service code of the system.
Ownership Tag	Displays the Ownership Tag of the system.
Signed Firmware Update	Displays whether the Signed Firmware Update is enabled on your system.

Table 3. System setup options—System information menu (continued)

Overview	
Processor Information	
Processor Type	Displays the processor type.
Maximum Clock Speed	Displays the maximum processor clock speed.
Minimum Clock Speed	Displays the minimum processor clock speed.
Current Clock Speed	Displays the current processor clock speed.
Core Count	Displays the number of cores on the processor.
Processor ID	Displays the processor identification code.
Processor L2 Cache	Displays the processor L2 Cache size.
Processor L3 Cache	Displays the processor L3 Cache size.
Microcode Version	Displays the microcode version.
Intel Hyper-Threading Capable	Displays whether the processor is Hyper-Threading (HT) capable.
64-Bit Technology	Displays whether 64-bit technology is used.
Memory Information	
Memory Installed	Displays the total system memory installed.
Memory Available	Displays the total system memory available.
Memory Speed	Displays the memory speed.
Memory Channel Mode	Displays single or dual channel mode.
Memory Technology	Displays the technology that is used for the memory.
DIMM SLOT1	Displays the memory in SLOT1
DIMM SLOT2	Displays the memory in SLOT2
Devices Information	
Video Controller	Displays the video controller type of the system.
Video Memory	Displays the video memory information of the system.
Wi-Fi Device	Displays the wireless device information of the system.
Native Resolution	Displays the native resolution of the system.
Video BIOS Version	Displays the video BIOS version of the system.
Audio Controller	Displays the audio controller information of the system.
Bluetooth Device	Displays the Bluetooth device information of the system.
LOM MAC Address	Displays the LAN On Motherboard (LOM) MAC address of the system.
Pass Through MAC Address	Displays the pass through MAC address of the system.
Cellular Device	Displays the M.2 PCIe SSD information of the system.

Table 4. System setup options—Boot Configuration menu

Boot Configuration	
Boot Sequence	
Boot mode	Displays the boot mode.
Boot Sequence	Displays the boot sequence.
Secure Boot	
Enable Secure Boot	Enable or disable the secure boot feature. By default, the option is not enabled.

Table 4. System setup options—Boot Configuration menu (continued)

Boot Configuration	
Secure Boot Mode	Enable or disable to change the secure boot mode options. By default, the **Deployed Mode** is enabled.
Expert Key Management	
Enable Custom Mode	Enable or disable custom mode. By default, the **custom mode** option is not enabled.
Custom Mode Key Management	Select the custom values for expert key management.

Table 5. System setup options—Integrated Devices menu

Integrated Devices	
Date/Time	Displays the current date in MM/DD/YYYY format and current time in HH:MM:SS AM/PM format.
Audio	
Enable Audio	Enable or disable the integrated audio controller. By default, the option is enabled.
USB/Thunderbolt Configuration	• Enable or disable booting from USB mass storage devices that are connected to external USB ports. By default, the **Enable Rear USB Ports** and **Enable Side USB Ports** options are enabled. • Enable or disable booting from USB mass storage devices such as external hard drive, optical drive, and USB drive. By default, the **Enable USB Boot Support** option is enabled.
Side USB Configuration	Enable or disable the individual USB ports. By default, the **Side Port 1(Near DP** and **Side Port 2** options are selected. **NOTE:** USB keyboard and mouse always work in the BIOS setup irrespective of this settings.
Rear USB Configuration	Enable or disable the individual USB ports. By default, all the options (**Rear Port 1(UP)**, **Rear Port 2(Down)** and **Rear Port 3(Type C)**)are selected. **NOTE:** USB keyboard and mouse always work in the BIOS setup irrespective of this settings.

Table 6. System setup options—Storage menu

Storage	
SATA/NVMe Operation	
SATA/NVMe Operation	Set the operating mode of the integrated storage device controller. By default, the **RAID On** option is enabled.
Storage interface	
Port Enablement	This page allows you to enable the onboard drives. By default, all the options are enabled.
SMART Reporting	
Enable SMART Reporting	Enable or disable Self-Monitoring, Analysis, and Reporting Technology (SMART) during system startup.

Table 6. System setup options—Storage menu (continued)

Storage	
	By default, the **Enable SMART Reporting** option is not enabled.
Drive Information	
SATA-1	
Type	Displays the SATA type information of the system.
Device	Displays the SATA device information of the system.
M.2 PCIe SSD	
Type	Displays the M.2 PCIe SSD type information of the system.
Device	Displays the M.2 PCIe SSD device information of the system.
PCIe M.2 eMMC	
Type	Displays the PCIe M.2 eMMC type information of the system.
Device	Displays the PCIe M.2 eMMC device information of the system.

Table 7. System setup options—Display menu

Display	
Primary Display	
Video Primary Display	This field determines which video controller will become the primary display when multiple controllers are available in the system. By default, **Auto** option is enabled.
Full Screen Logo	Enable or disable full screen logo. By default, the option is not enabled.

Table 8. System setup options—Connection menu

Connection	
Network Controller Configuration	
Integrated NIC	If enabled, UEFI networking protocols are installed and available, allowing pre-OS and early OS networking features to use any enabled NIC's. This may be used without PXE turned on. By default, **Enabled with PXE** option is enabled.
Wireless Device Enable	
WLAN	Enable or disable the internal WLAN device By default, the option enabled.
Bluetooth	Enable or disable the internal Bluetooth device By default, the option enabled.
Enable UEFI Network Stack	Enable or disable UEFI Network Stack and controls the on-board LAN Controller. By default, the **Enable UEFI Network Stack** option is enabled.
HTTPs Boot Feature	
HTTPs Boot	Enable or disable the HTTPs Boot feature. By default, the **HTTPs Boot** option is enabled.

Table 9. System setup options—Power menu

Power	
USB Wake Support	
Enable USB Wake Support	When enabled, connecting Dell USB devices will wake the system from standby. By default, the option is enabled.
AC Behaviour	
AC Recovery	Allows to determine what happens when AC power is restored after an unexpected loss of AC power. By default, the **Power Off** option is enabled.
Active State Power Management	
Aspm	Enable the Active State Power Management (ASPM) level. By default, the **Auto** option is enabled.
Block Sleep	Enables to block entering sleep (S3) mode in the operating system. By default, the **Block Sleep** option is disabled.
Deep Sleep Control	Allows to conserve more power while in Shutdown (SS) or Hibernate (S4) mode. By default, the **Enabled in S4 and SS** option is enabled.
Fan Control Override	Determines the speed of the fan. By default, the option is disabled.
Intel Speed Shift Technology	Enable or disable the Intel speed shift technology support. By default, the **Intel Speed Shift Technology** option is enabled.

Table 10. System setup options—Security menu

Security	
TPM 2.0 Security	
TPM 2.0 Security On	Enable or disable TPM 2.0 security options. By default, the **TPM 2.0 Security On** option is enabled.
Attestation Enable	Enables to control whether the Trusted Platform Module (TPM) Endorsement Hierarchy is available to the operating system. By default, the **Attestation Enable** option is enabled.
Key Storage Enable	Enables to control whether the Trusted Platform Module (TPM) Storage Hierarchy is available to the operating system. By default, the **Key Storage Enable** option is enabled.
SHA-256	BIOS and the TPM will use the SHA-256 hash algorithm to extend measurements into the TPM PCRs during BIOS boot. By default, the **SHA-256** option is enabled.
Clear	Enables to clear the TPM owner information and returns the TPM to the default state. By default, the **Clear** option is disabled.
PPI ByPass for Clear Commands	Controls the TPM Physical Presence Interface (PPI). By default, the **PPI ByPass for clear Commands** option is disabled.
Intel Total Memory Encryption	

Table 10. System setup options—Security menu (continued)

Security	
Total Memory Encryption	Enable or disable you to protect memory from physical attacks including freeze spray, probing DDR to read the cycles, and others. By default, the **Total Memory Encryption** option is disabled.
Chassis intrusion	Controls the chassis intrusion feature. By default, the **Disabled** option is enabled.
Clear Intrusion	By default, the option is disabled.
Chassis Intrusion Reset	Resets the chassis intrusion. By default, the option is disabled.
SMM Security Mitigation	Enable or disable SMM Security Mitigation. By default, the option is enabled.
Data Wipe on Next Boot	
Start Data Wipe	Enable or disable the data wipe on next boot. By default, the option is disabled.
Absolute	Enable or disable or permanently disable the BIOS module interface of the optional Absolute Persistence Module service from Absolute software. By default, the option is enabled.
UEFI Boot Path Security	Controls whether the system will prompt the user to enter the admin password (if set) when booting to a UEFI boot device from the F12 boot menu. By default, the **Always Except Internal HDD** option is enabled.

Table 11. System setup options—Passwords menu

Passwords	
Admin Password	Set, change, or delete the administrator password.
System Password	Set, change, or delete the system password.
Internal HDD-1 Password	Set, change, or delete the Internal HDD-1 password
NVMe SSD0	Set, change, or delete the NVMe SSD0 password.
Password Configuration	
Upper Case Letter	Reinforces password must have at least one upper case letter. By default, the option is enabled.
Lower Case Letter	Reinforces password must have at least one lower case letter. By default, the option is enabled.
Digit	Reinforces password must have at least one digit. By default, the option is enabled.
Special Character	Reinforces password must have at least one special character. By default, the option is enabled.
Minimum Characters	Set the minimum characters allowed for password.
Password Bypass	When enabled, this always prompts for system and internal hard drive passwords when powered on from the off state. By default, the **Disabled** option is selected.
Password Changes	

Table 11. System setup options—Passwords menu (continued)

Passwords	
Enable Non-Admin Password Changes	Enable or disable to change system and hard drive password without the need for admin password. By default, the option is disabled.
Admin Setup Lockout	
Enable Admin Setup Lockout	Enables administrators control over how their users can or cannot access BIOS setup. By default, the option is disabled.
Master Password Lockout	
Enable Master Password Lockout	When enabled, this disables the master password support. By default, the option is disabled.
Allow Non-Admin PSID Revert	
Enable Allow Non-Admin PSID Revert	Controls access to the Physical Security ID (PSID) revert of NVMe hard-drives from the Dell Security Manager prompt. By default, the option is disabled.

Table 12. System setup options—Update, Recovery menu

Update, Recovery	
UEFI Capsule Firmware Updates	Enable or disable BIOS updates through UEFI capsule update packages. By default, the option is enabled.
BIOS Recovery from Hard Drive	Enables the user to recover from certain corrupted BIOS conditions from a recovery file on the user primary hard drive or an external USB key. By default, the option is enabled.
BIOS Downgrade	
Allow BIOS Downgrade	Enable or disable the flashing of the system firmware to previous revision is blocked. By default, the option is enabled.
SupportAssist OS Recovery	Enable or disable the boot flow for SupportAssist OS Recovery tool in the event of certain system errors. By default, the option is enabled.
BIOSConnect	Enable or disable cloud Service operating system recovery if the main operating system fails to boot with the number of failures equal to or greater than the value specified by the Auto operating system Recovery Threshold setup option and local Service operating system does not boot or is not installed. By default, the option is enabled.
Dell Auto operating system Recovery Threshold	Controls the automatic boot flow for SupportAssist System Resolution Console and for Dell operating system Recovery Tool. By default, the threshold value is set to 2.

Table 13. System setup options—System Management menu

System Management	
Service Tag	Display the Service Tag of the system.
Asset Tag	Create a system Asset Tag.
Anable Watchdog Timer	

Table 13. System setup options—System Management menu (continued)

System Management	
Watchdog Timer Support	Enable or disable the Watchdog Timer Feature. By default, the option is disabled.
Wake on LAN	
Wake on LAN	Enable or disable the system to power on by special LAN signals when it receives a wakeup signal from the WLAN. By default, the **Disabled** option is selected.
Auto on Time	Enable to set the system to turn on automatically every day or on a preselected date and time. This option can be configured only if the Auto On Time is set to Everyday, Weekdays, or Selected Days. By default, the option is disabled.
Intel AMT Capability	
Enable Intel AMT Capability	By default **Restrict MEBx Access** option is enabled.
MEBx Hotkey	
Enable MEBx Hotkey	When enabled, this allows the use of Ctrl+P hotkey to access MEBx. By default **OFF** option is disabled.
USB Provision	
Enable USB Provision	Intel AMT can be provisioned using the local provisioning file using a USB storage device. By default **OFF** option is disabled.

Table 14. System setup options—Keyboard menu

Keyboard	
Keyboard Errors	
Enable Keyboard Error Detection	Allows keyboard related errors to be reported when the system boots. By default, the option is enabled.
Device Configuration Hotkey Access	Manages whether you can access device configuration screens through hotkeys during system startup. By default, the option is enabled.

Table 15. System setup options—Pre-boot Behavior menu

Pre-boot Behavior	
Adapter Warnings	
Enable Adapter Warnings	Enable or disable the warning messages during boot when the adapters with less power capacity are detected. By default, the option is enabled.
Warning and Errors	Enable or disable the action to be done when a warning or error is encountered. By default, the **Prompt on Warnings and Errors** option is enabled.
USB-C Warnings	
Enable Dock Warning Messages	By default, the option is enabled.
Fastboot	Enable to set the speed of the boot process. By default, the **Minimal** option is enabled.

Table 15. System setup options—Pre-boot Behavior menu (continued)

Pre-boot Behavior	
Extend BIOS POST Time	Set the BIOS POST time. By default, the **0 seconds** option is enabled.
MAC Address Pass-Through	Replaces the external NIC MAC address with the selected MAC address from the system. By default, the **System Unique MAC Address** option is enabled.

Table 16. System setup options—Virtualization menu

Virtualization	
Intel Virtualization Technology	
Enable Intel Virtualization Technology (VT)	Specify whether a Virtual Machine Monitor (VMM) can use the additional hardware capabilities that are provided by Intel Virtualization Technology. By default, the option is enabled.
VT for Direct I/O	Specify whether a Virtual Machine Monitor (VMM) can use the additional hardware capabilities that are provided by Intel Virtualization Technology for Direct I/O. By default, the option is enabled.

Table 17. System setup options—Performance menu

Performance	
Multi Core Support	
Active Cores	Enables to change the number of CPU cores available to the operating system. By default, the **All Cores** option is enabled.
Intel SpeedStep	
Enable Intel SpeedStep Technology	Enables the system to dynamically adjust processor voltage and core frequency, decreasing average power consumption and heat production. By default, the option is enabled.
C-States Control	
Enable C-State Control	Enable or disable additional processor sleep states. By default, the option is enabled.
Intel Turbo Boost Technology	
Enable Intel Turbo Boost Technology	Enable or disable Intel TurboBoost mode of the processor. By default, the option is enabled.
Intel Hyper-Threading Technology	
Enable Intel Hyper-Threading Technology	Enable or disable Hyper-Threading in the processor. By default, the option is enabled.
Dynamic Tuning:Machine Learning	
Enable Dynamic Tuning:Machine Learning	Enables the operating system capability to enhance dynamic power tuning capabilities based on detected workloads. By default, the option is disabled.

Table 18. System setup options—System Logs menu

System Logs	
BIOS Event Log	
Clear Bios Event Log	Display BIOS events. By default, the **Keep** option is enabled.

Updating the BIOS

Updating the BIOS in Windows

About this task

CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system re-install. For more information on this subject, see Knowledge Article: https://www.dell.com/support/article/sln153694

Steps

1. Go to www.dell.com/support.
2. Click **Product support**. In the **Search support** box, enter the Service Tag of your computer, and then click **Search**.
   NOTE: If you do not have the Service Tag, use the SupportAssist feature to automatically identify your computer. You can also use the product ID or manually browse for your computer model.
3. Click **Drivers & Downloads**. Expand **Find drivers**.
4. Select the operating system installed on your computer.
5. In the **Category** drop-down list, select **BIOS**.
6. Select the latest version of BIOS, and click **Download** to download the BIOS file for your computer.
7. After the download is complete, browse the folder where you saved the BIOS update file.
8. Double-click the BIOS update file icon and follow the on-screen instructions.
   For more information, see knowledge base article 000124211 at www.dell.com/support.

Updating the BIOS in Linux and Ubuntu

To update the system BIOS on a computer that is installed with Linux or Ubuntu, see the knowledge base article 000131486 at www.dell.com/support.

Updating the BIOS using the USB drive in Windows

About this task

CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system re-install. For more information on this subject, see Knowledge Article: https://www.dell.com/support/article/sln153694

Steps

1. Follow the procedure from step 1 to step 6 in Updating the BIOS in Windows to download the latest BIOS setup program file.

2. Create a bootable USB drive. For more information, see the knowledge base article 000145519 at www.dell.com/support.
3. Copy the BIOS setup program file to the bootable USB drive.
4. Connect the bootable USB drive to the computer that needs the BIOS update.
5. Restart the computer and press **F12** .
6. Select the USB drive from the **One Time Boot Menu**.
7. Type the BIOS setup program filename and press **Enter**.
   The **BIOS Update Utility** appears.
8. Follow the on-screen instructions to complete the BIOS update.

Updating the BIOS from the F12 One-Time boot menu

Update your computer BIOS using the BIOS update.exe file that is copied to a FAT32 USB drive and booting from the F12 One-Time boot menu.

About this task

CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system re-install. For more information on this subject, see Knowledge Article: https://www.dell.com/support/article/sln153694

BIOS Update

You can run the BIOS update file from Windows using a bootable USB drive or you can also update the BIOS from the F12 One-Time boot menu on the computer.

Most of the Dell computers built after 2012 have this capability, and you can confirm by booting your computer to the F12 One-Time Boot Menu to see if BIOS FLASH UPDATE is listed as a boot option for your computer. If the option is listed, then the BIOS supports this BIOS update option.

NOTE: Only computers with BIOS Flash Update option in the F12 One-Time boot menu can use this function.

Updating from the One-Time boot menu

To update your BIOS from the F12 One-Time boot menu, you need the following:

- USB drive formatted to the FAT32 file system (key does not have to be bootable)
- BIOS executable file that you downloaded from the Dell Support website and copied to the root of the USB drive
- AC power adapter that is connected to the computer
- Functional computer battery to flash the BIOS

Perform the following steps to perform the BIOS update flash process from the F12 menu:

CAUTION: Do not turn off the computer during the BIOS update process. The computer may not boot if you turn off your computer.

Steps

1. From a turn off state, insert the USB drive where you copied the flash into a USB port of the computer.
2. Turn on the computer and press F12 to access the One-Time Boot Menu, select BIOS Update using the mouse or arrow keys then press Enter.
   The flash BIOS menu is displayed.
3. Click **Flash from file**.
4. Select external USB device.
5. Select the file and double-click the flash target file, and then click **Submit**.
6. Click **Update BIOS**. The computer restarts to flash the BIOS.
7. The computer will restart after the BIOS update is completed.

System and setup password

Table 19. System and setup password

Password type	Description
System password	Password that you must enter to log in to your system.
Setup password	Password that you must enter to access and make changes to the BIOS settings of your computer.

You can create a system password and a setup password to secure your computer.

CAUTION: The password features provide a basic level of security for the data on your computer.

CAUTION: Anyone can access the data that is stored on your computer if it is not locked and left unattended.

NOTE: System and setup password feature is disabled.

Assigning a system setup password

Prerequisites

You can assign a new **System or Admin Password** only when the status is in **Not Set**.

About this task

To enter the system setup, press F12 immediately after a power-on or reboot.

Steps

1. In the **System BIOS** or **System Setup** screen, select **Security** and press Enter.
   The **Security** screen is displayed.
2. Select **System/Admin Password** and create a password in the **Enter the new password** field.
   Use the following guidelines to assign the system password:
   - A password can have up to 32 characters.
   - At least one special character: ! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [\ ] ^ _ ` { | }
   - Numbers 0 through 9.
   - Upper case letters from A to Z.
   - Lower case letters from a to z.
3. Type the system password that you entered earlier in the **Confirm new password** field and click **OK**.
4. Press Esc and save the changes as prompted by the pop-up message.
5. Press Y to save the changes.
   The computer restarts.

Deleting or changing an existing system setup password

Prerequisites

Ensure that the **Password Status** is Unlocked (in the System Setup) before attempting to delete or change the existing System and/or Setup password. You cannot delete or change an existing System or Setup password, if the **Password Status** is Locked.

About this task

To enter the System Setup, press F12 immediately after a power-on or reboot.

Steps

1. In the **System BIOS** or **System Setup** screen, select **System Security** and press Enter.
   The **System Security** screen is displayed.
2. In the **System Security** screen, verify that **Password Status** is **Unlocked**.
3. Select **System Password**, update, or delete the existing system password, and press Enter or Tab.
4. Select **Setup Password**, update, or delete the existing setup password, and press Enter or Tab.

   NOTE: If you change the System and/or Setup password, reenter the new password when prompted. If you delete the System and/or Setup password, confirm the deletion when prompted.

5. Press Esc and a message prompts you to save the changes.
6. Press Y to save the changes and exit from System Setup.
   The computer restarts.

Clearing BIOS (System Setup) and System passwords

About this task

To clear the system or BIOS passwords, contact Dell technical support as described at www.dell.com/contactdell.

NOTE: For information on how to reset Windows or application passwords, refer to the documentation accompanying Windows or your application.

6

Troubleshooting

Topics:

Dell SupportAssist Pre-boot System Performance Check diagnostics

About this task

SupportAssist diagnostics (also known as system diagnostics) performs a complete check of your hardware. The Dell SupportAssist Pre-boot System Performance Check diagnostics is embedded with the BIOS and is launched by the BIOS internally. The embedded system diagnostics provides a set of options for particular devices or device groups allowing you to:

- Run tests automatically or in an interactive mode
- Repeat tests
- Display or save test results
- Run thorough tests to introduce additional test options to provide extra information about the failed device(s)
- View status messages that inform you if tests are completed successfully
- View error messages that inform you of problems encountered during testing

NOTE: Some tests for specific devices require user interaction. Always ensure that you are present at the computer terminal when the diagnostic tests are performed.

For more information, see https://www.dell.com/support/kbdoc/000180971.

Running the SupportAssist Pre-Boot System Performance Check

Steps

1. Turn on your computer.
2. As the computer boots, press the F12 key as the Dell logo appears.
3. On the boot menu screen, select the **Diagnostics** option.
4. Click the arrow at the bottom left corner.
   Diagnostics front page is displayed.
5. Click the arrow in the lower-right corner to go to the page listing.
   The items detected are listed.
6. To run a diagnostic test on a specific device, press Esc and click **Yes** to stop the diagnostic test.
7. Select the device from the left pane and click **Run Tests**.
8. If there are any issues, error codes are displayed.
   Note the error code and validation number and contact Dell.

Diagnostic LED

Instead of beep codes, errors are indicated by the bicolor Battery Charge/Status LED. A specific blink pattern is followed by flashing a pattern of flashes in amber, followed by white. The pattern then repeats.

NOTE: The diagnostic pattern consists of a two-digit number being represented by a first group of LED blinks (1 through 9) in amber, followed by a 1.5 s pause with the LED off, and then a second group of LED blinks (1 through 9) in white. This is then followed by a three second pause, with the LED off, before repeating over again. Each LED blink takes 1.5 s.

The system will not shut down when displaying the Diagnostic Error Codes.

Diagnostic Error Codes will always supersede any other use of the LED.

Table 20. Diagnostic LED/Beep codes

Blinking Patterns		Problem description	Faults
Amber	White		
2	1	Faulty system board	Faulty system board
2	2	Faulty system board, power supply, unit (PSU), or cabling	Faulty system board, power supply, unit (PSU), or cabling
2	3	Faulty system board, CPU, or DIMMS	Faulty system board, power supply, unit (PSU), or DIMMS
2	4	Faulty coin cell battery	Faulty coin cell battery
2	5	BIOS Recovery	Auto-Recovery trigger, recovery image is not found or is invalid.
2	7	Memory	Memory SPD failure
3	3	Memory	No memory detected
3	5	Memory	Modules incompatible or invalid configuration
3	6	BIOS Recovery	On-demand trigger, recovery image is not found.
3	7	BIOS Recovery	On-demand trigger, recovery image is invalid.

NOTE: For diagnostics pattern 2-amber, 8-white connects an external monitor to isolate between system board or graphics controller failure.

Recovering the operating system

When your computer is unable to boot to the operating system even after repeated attempts, it automatically starts Dell SupportAssist OS Recovery.

Dell SupportAssist OS Recovery is a standalone tool that is preinstalled in all Dell computers installed with Windows operating system. It consists of tools to diagnose and troubleshoot issues that may occur before your computer boots to the operating system. It enables you to diagnose hardware issues, repair your computer, back up your files, or restore your computer to its factory state.

You can also download it from the Dell Support website to troubleshoot and fix your computer when it fails to boot into their primary operating system due to software or hardware failures.

For more information about the Dell SupportAssist OS Recovery, see *Dell SupportAssist OS Recovery User's Guide* at www.dell.com/serviceabilitytools. Click **SupportAssist** and then, click **SupportAssist OS Recovery**.

Real-Time Clock (RTC Reset)

The Real Time Clock (RTC) reset function allows you or the service technician to recover Dell systems from No POST/No Power/No Boot situations. The legacy jumper enabled RTC reset has been retired on these models.

Start the RTC reset with the system powered off and connected to AC power. Press and hold the power button for 20 seconds. The system RTC Reset occurs after you release the power button.

Backup media and recovery options

It is recommended to create a recovery drive to troubleshoot and fix problems that may occur with Windows. Dell proposes multiple options for recovering Windows operating system on your Dell PC. For more information. see Dell Windows Backup Media and Recovery Options.

WiFi power cycle

About this task

If your computer is unable to access the internet due to WiFi connectivity issues a WiFi power cycle procedure may be performed. The following procedure provides the instructions on how to conduct a WiFi power cycle:

NOTE: Some ISPs (Internet Service Providers) provide a modem/router combo device.

Steps

1. Turn off your computer.
2. Turn off the modem.
3. Turn off the wireless router.
4. Wait for 30 seconds.
5. Turn on the wireless router.
6. Turn on the modem.
7. Turn on your computer.

7

Getting help and contacting Dell

Self-help resources

You can get information and help on Dell products and services using these self-help resources:

Table 21. Self-help resources

Self-help resources	Resource location
Information about Dell products and services	www.dell.com
My Dell app	
Tips	
Contact Support	In Windows search, type `Contact Support`, and press Enter.
Online help for operating system	www.dell.com/support/windows
Access top solutions, diagnostics, drivers and downloads, and learn more about your computer through videos, manuals and documents.	Your Dell computer is uniquely identified by a Service Tag or Express Service Code. To view relevant support resources for your Dell computer, enter the Service Tag or Express Service Code at www.dell.com/support. For more information on how to find the Service Tag for your computer, see Locate the Service Tag on your computer.
Dell knowledge base articles for a variety of computer concerns	1. Go to www.dell.com/support. 2. On the menu bar at the top of the Support page, select **Support** > **Knowledge Base**. 3. In the Search field on the Knowledge Base page, type the keyword, topic, or model number, and then click or tap the search icon to view the related articles.

Contacting Dell

To contact Dell for sales, technical support, or customer service issues, see www.dell.com/contactdell.

NOTE: Availability varies by country/region and product, and some services may not be available in your country/region.

NOTE: If you do not have an active Internet connection, you can find contact information about your purchase invoice, packing slip, bill, or Dell product catalog.