


Latitude 12 Rugged Extreme Tablet – 7212

Owner's Manual

Notes, cautions, and warnings

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

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

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

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Working on your computer

Topics:

- [Safety instructions](#)
- [Before working inside your computer](#)
- [Turning off your — Windows 10](#)
- [After working inside your computer](#)

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 the following conditions exist:

- You have read the safety information that shipped with your computer.
- A component can be replaced or, if purchased separately, installed by performing the removal procedure in the reverse order.

i **NOTE:** Disconnect 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 to the power source.

i **NOTE:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance

△ **CAUTION:** Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that came with the product.

△ **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface that is grounded to ground yourself before you touch the computer to perform any disassembly tasks.

△ **CAUTION:** Handle components and cards with care. Do not touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a processor by its edges, not by its pins.

△ **CAUTION:** When you disconnect a cable, pull on its connector or on its pull-tab, not on the cable itself. Some cables have connectors with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before you disconnect the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.

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

Before working inside your computer

To avoid damaging your computer, perform the following steps before you begin working inside the computer.

1. Ensure that you follow the Safety instruction.
2. Ensure that your work surface is flat and clean to prevent the computer cover from being scratched.
3. Turn off your computer.
4. If the computer is connected to a docking device (docked) such as the optional Media Base or Battery Slice, undock it.

CAUTION: To disconnect a network cable, first unplug the cable from your computer and then unplug the cable from the network device.

5. Disconnect all network cables from the computer.
6. Disconnect your computer and all attached devices from their electrical outlets.
7. Turn the computer upside-down on a flat work surface.

NOTE: Ensure to close the display if the system is a laptop. To avoid damaging the system board, remove the main battery before you service the computer.

8. Remove the main battery.
9. Turn the computer top-side up.

NOTE: Open the display if the system is a laptop.


10. Press the power button to ground the system board.

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.

11. Remove any installed ExpressCards or Smart Cards from the appropriate slots.

Turning off your — Windows 10

TWISSIJA: To avoid losing data, save and close all open files and exit all open programs before you turn off your computer .

1. Click or tap .

2. Click or tap  and then click or tap **Shut down**.

NOTE: Ensure that the computer and all attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your operating system, press and hold the power button for about 6 seconds to turn them off.

After working inside your computer

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

CAUTION: To avoid damage to the computer, use only the battery designed for this particular Dell computer. Do not use batteries designed for other Dell computers.

1. Connect any external devices, such as a port replicator or media base, and replace any cards, such as an ExpressCard.
2. Connect any telephone or network cables to your computer.

CAUTION: To connect a network cable, first plug the cable into the network device and then plug it into the computer.

3. Connect your computer and all attached devices to their electrical outlets.
4. Turn on your computer.

Removing and installing components

This section provides detailed information on how to remove or install the components from your computer.

Topics:

- [Recommended tools](#)
- [Screw size list](#)
- [Battery](#)
- [Installing the battery when the cross strap is attached - Optional](#)
- [Subscriber Identification Module \(SIM\) card](#)
- [Display assembly](#)
- [Stylus](#)
- [WLAN card](#)
- [WWAN card](#)
- [CMOS battery](#)
- [Power button assembly](#)
- [Micro serial port and power connector port](#)
- [Front camera](#)
- [Microphone](#)
- [Heat sink for SSD](#)
- [PCIe Solid State Drive \(SSD\)](#)
- [System fan](#)
- [System Board](#)
- [Docking Board](#)
- [Back Camera](#)
- [Smartcard holder](#)
- [Bottom base assembly](#)

Recommended tools

The procedures in this document require the following tools:

- Phillips #0 screwdriver
- Phillips #1 screwdriver
- Standard DSP plastic scribe

Screw size list

Table 1. Latitude 7212 Rugged Extreme Tablet screw size list

Component	M2*2	M2*2.5	M2*3	M2*4	M2*5	M2.5*3	M2.5*5	M2.5*8
Smart card	6							
Bottom Base	6		81				19	
Front Camera					2			
Rear Camera					3			

Table 1. Latitude 7212 Rugged Extreme Tablet screw size list (continued)

Component	M2*2	M2*2.5	M2*3	M2*4	M2*5	M2.5*3	M2.5*5	M2.5*8
Protective Rubber Bumper(all four corners)								8
WLAN			1					
WWAN			1					
M.2 SSD			1					
System Board Assembly (System Board and Fan)					14			
Power Button Assembly		1						
DC-In Cable and Bracket					3			
Kensington Lock Bracket			3					
LCD Bezel							19	
Bracket Docking			1					

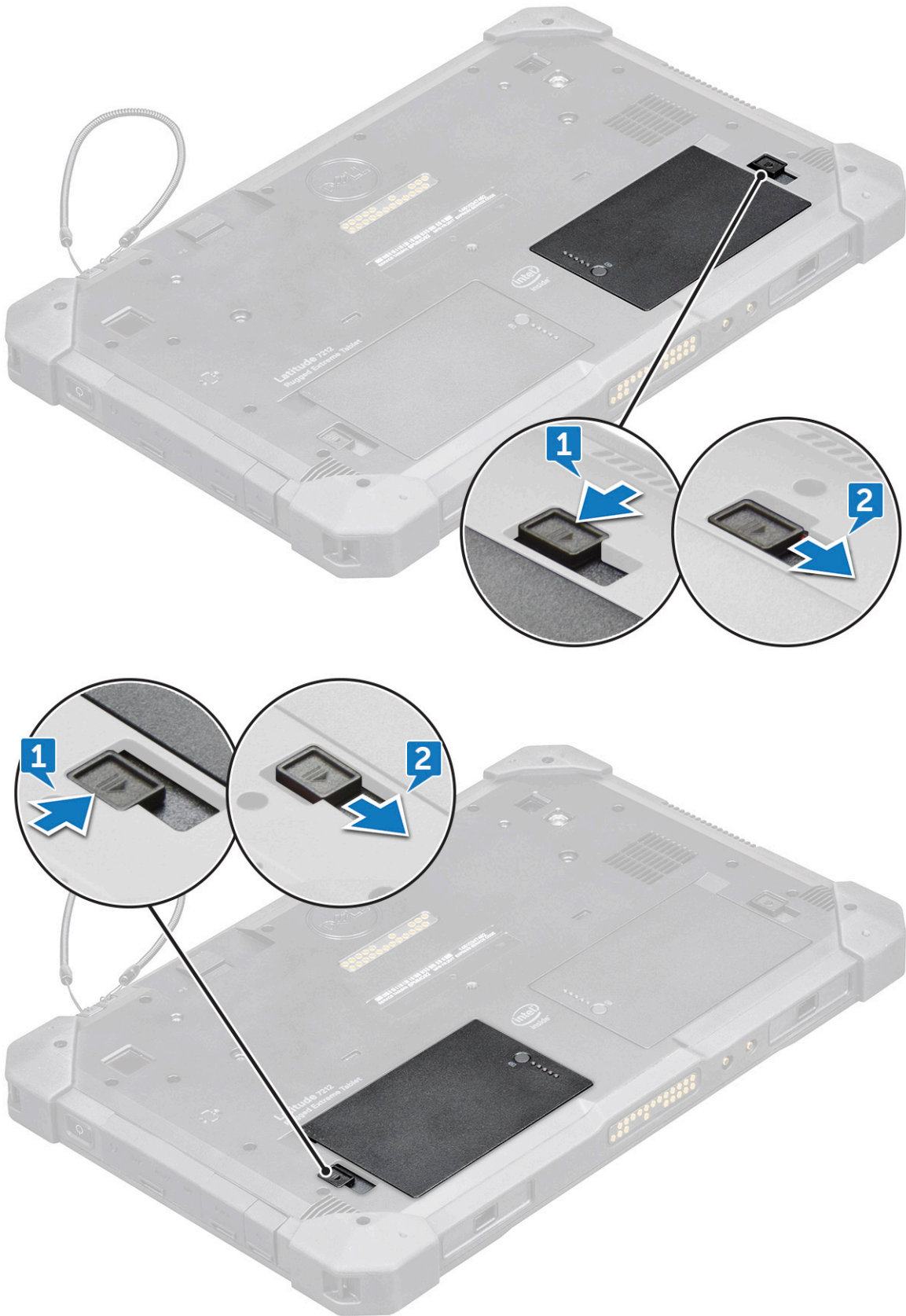
Battery

Removing the battery

⚠ WARNING: Using an incompatible battery may increase the risk of fire or explosion. Replace the battery only with a compatible battery purchased from Dell. The battery is designed to work with your Dell Tablet. Do not use a battery from any other computer with your tablet.

⚠ WARNING: Before removing or replacing the battery, turn off the computer, disconnect the AC adapter from the electrical outlet and the tablet, and remove any other external cables from the tablet.

1. Follow the procedure in [Before Working Inside Your Computer](#).
2. Locate the battery and slide the battery latch to unlock the battery release latch [1].
3. Push the button in a downward direction to release the battery [2].



The battery is released from the battery bay.

4. Lift the edge of the battery that pops up.

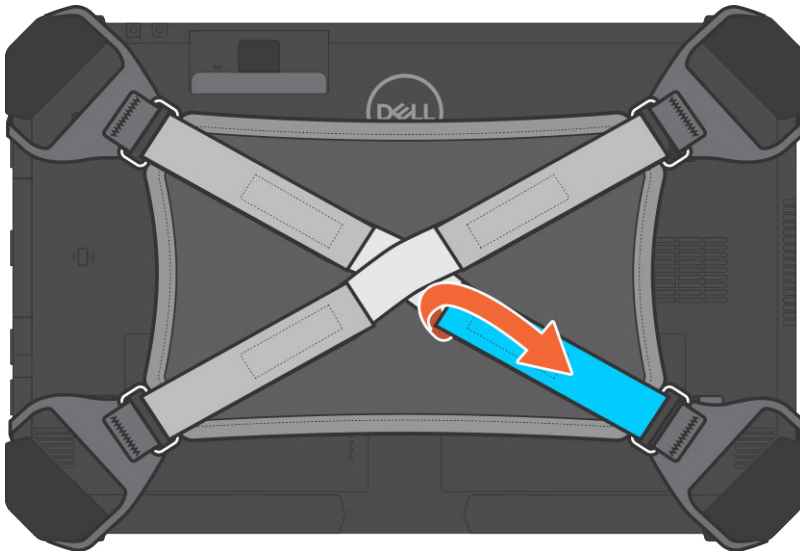


Removing the battery when the cross strap is attached - Optional

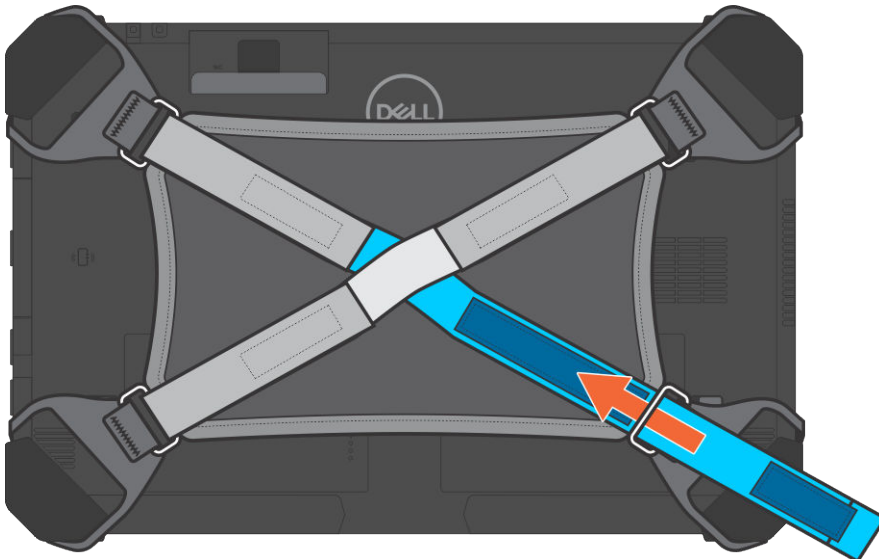
⚠ WARNING: Using an incompatible battery may increase the risk of fire or explosion. Replace the battery only with a compatible battery purchased from Dell. The battery is designed to work with your Dell Tablet. Do not use a battery from any other computer with your tablet.

⚠ WARNING: Before removing or replacing the battery, turn off the computer, disconnect the AC adapter from the electrical outlet and the tablet, and remove any other external cables from the tablet.

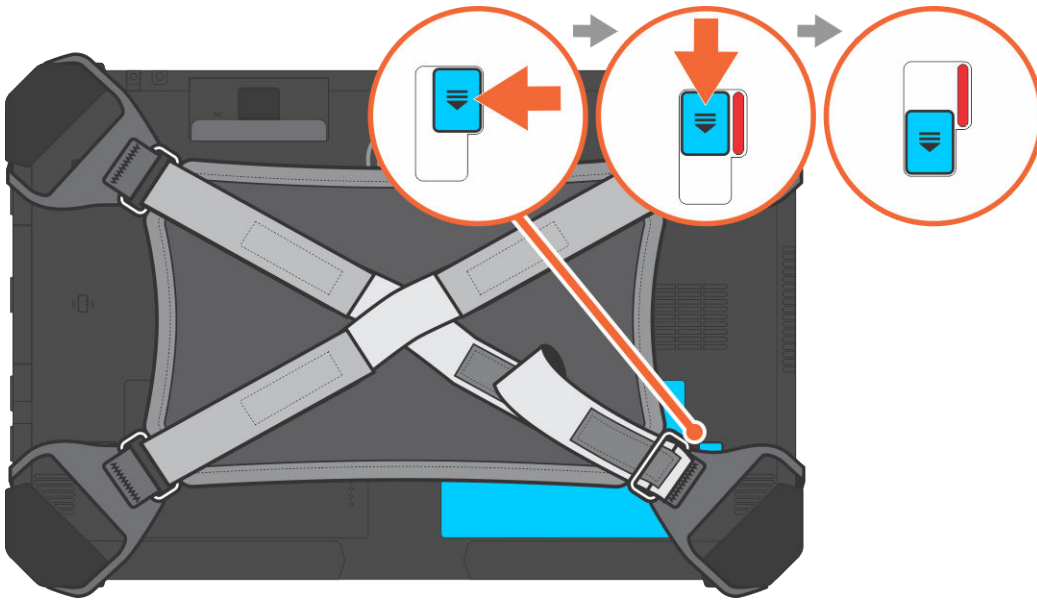
1. Follow the procedure in [Before Working Inside Your Computer](#).
2. Peel off the velcro strap.



3. Slide the strap and release the strap from the holder to access the battery latch.

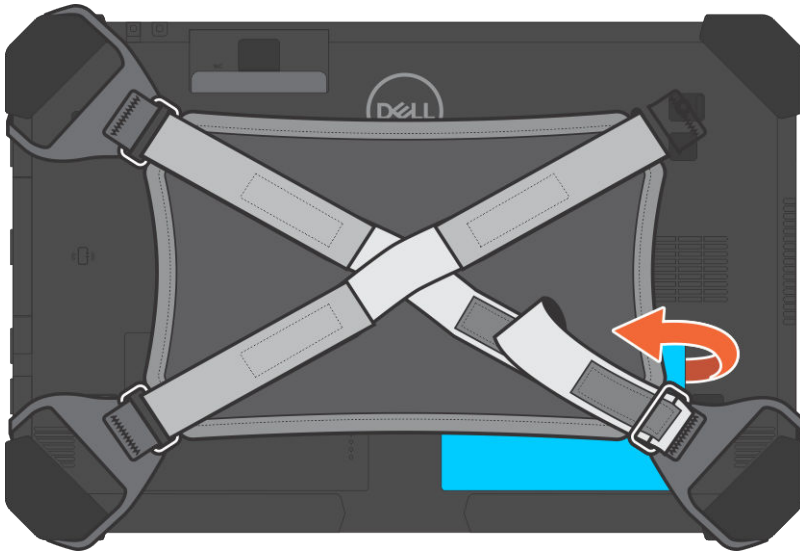


4. Slide the battery latch to unlock the battery release latch and then push the latch in a downward direction to release the battery.



The battery is released from the battery bay.

5. Lift the edge of the battery that pops up to release the battery.



Installing the battery

1. Insert the battery into the battery slot.

i **NOTE:** Ensure the metal pin of the battery is aligned in place.

2. Slide the battery into the slot until it clicks into place.
3. Make sure the battery latch is back to the locked state.

i **NOTE:** There are two battery. Perform steps 1 to 3 to install battery 1 and battery 2 on the tablet.

4. Follow the procedure in [After working inside your computer.](#)

Installing the battery when the cross strap is attached - Optional

1. Insert the battery into the battery slot.
2. Slide the battery into the slot until it clicks into place and locked.
3. Slide the velcro strap into the strap holder.
4. Affix the velcro strap.
5. Follow the procedure in [After working inside your computer.](#)

Subscriber Identification Module (SIM) card

Removing uSIM

1. Follow the procedure in [Before working inside your computer.](#)
2. Remove the left [battery](#).
3. Lift the latch [1] and pull the SIM slot cap [2].



4. Pull the SIM from the slot until it is released [3].
i **NOTE:** Use a flat pointed scribe to ease removing the SIM.
5. Press the SIM slot cap to initial state.
6. Install the:
 - a. Left [battery](#)

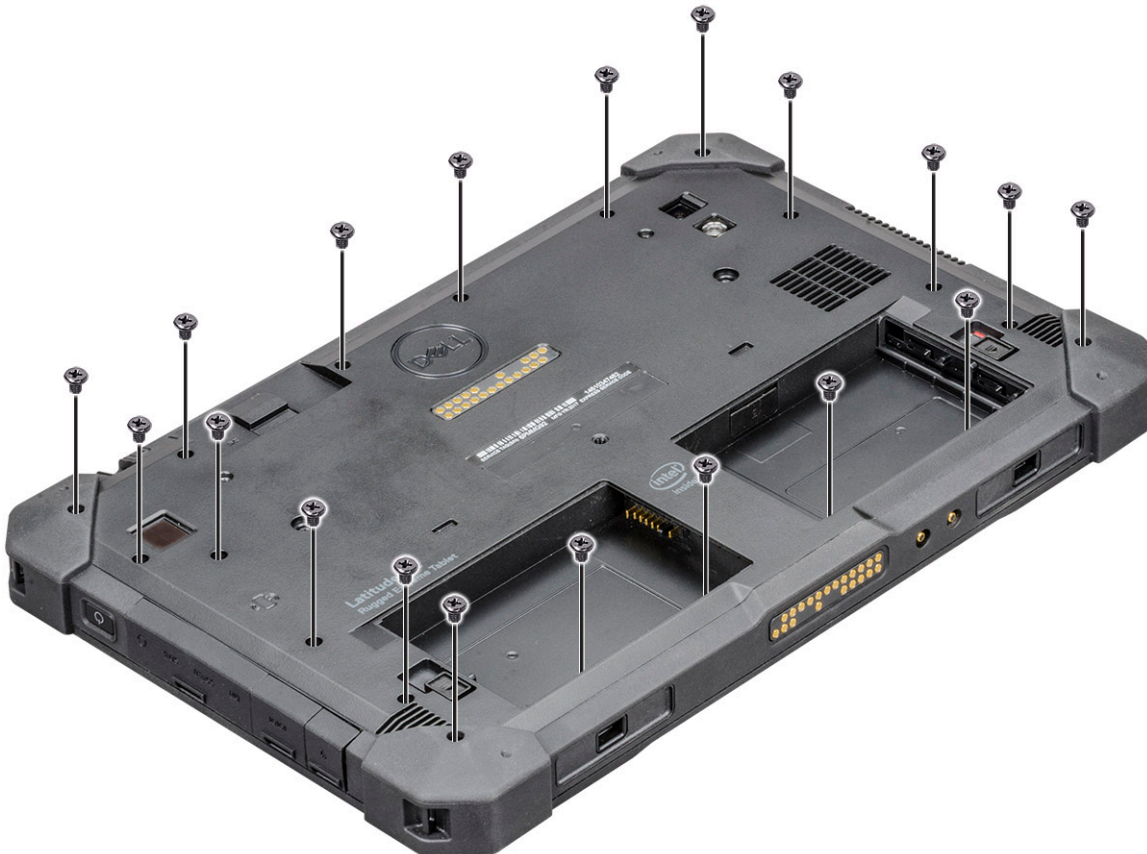
Inserting the uSIM

1. Remove the left [battery](#)
2. To insert the uSIM:
 - a. Lift the latch and remove the SIM slot cap.
 - b. Insert the SIM in the slot until it is locked.
NOTE: Ensure the gold chip is facing down in the slot.
 - c. Press the SIM slot cap to initial state.
3. Follow the procedure in [After working inside your computer](#).

Display assembly

Removing display assembly

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the:
 - a. [Battery](#)
3. To remove the display assembly (with plastic scribe):
 - a. Place the display side of system on a smooth flat surface.
 - b. Remove the screws (19) that secures the display panel to the tablet.



4. Flip the system so that the display assembly is at top view.



5. Insert a plastic scribe near the Windows button [1].

i **NOTE:** Pointed tip of the plastic scribe should be inserted to avoid damage to the seal on the LCD and to the clips that secure the LCD display to the tablet chassis.

6. Pry the edges starting from Windows button clockwise [1,2].

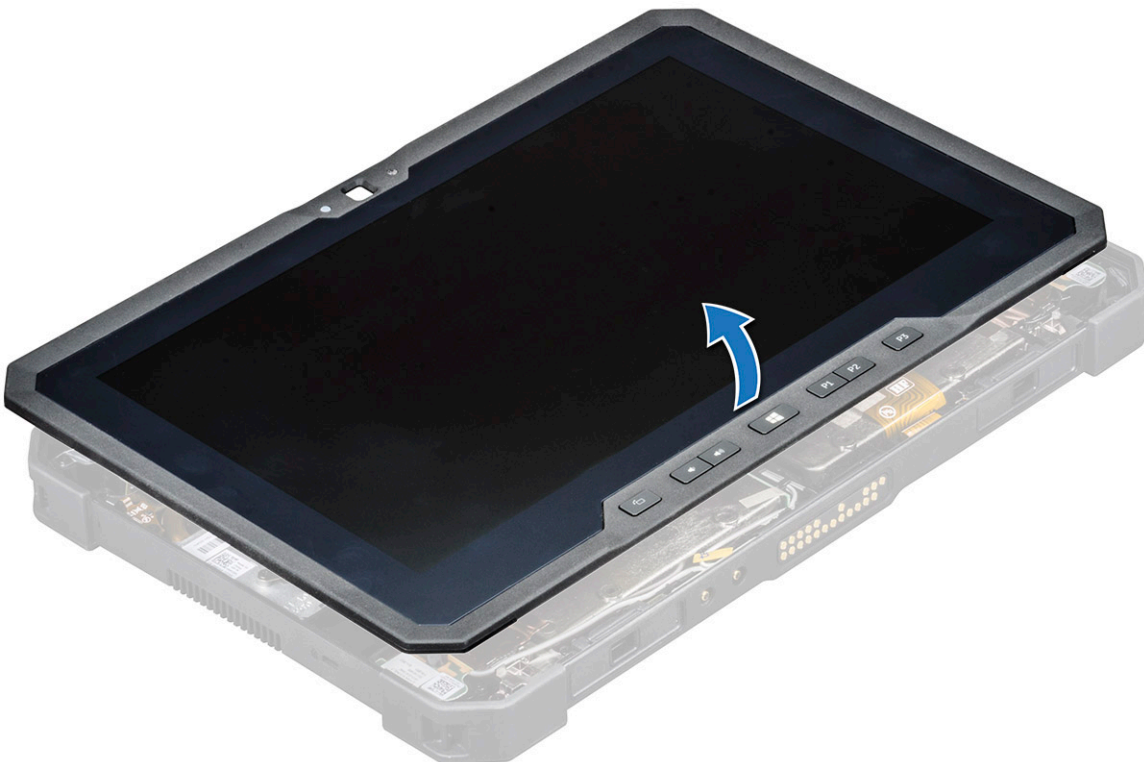


i **NOTE:** Gently pry the edges evenly to unlock the plastic clips that secures the display assembly to the tablet chassis.

7. Lift the display assembly [1] by angle 15° and slide it from the chassis [2].



8. Flip the display assembly by an angle less than 90°.



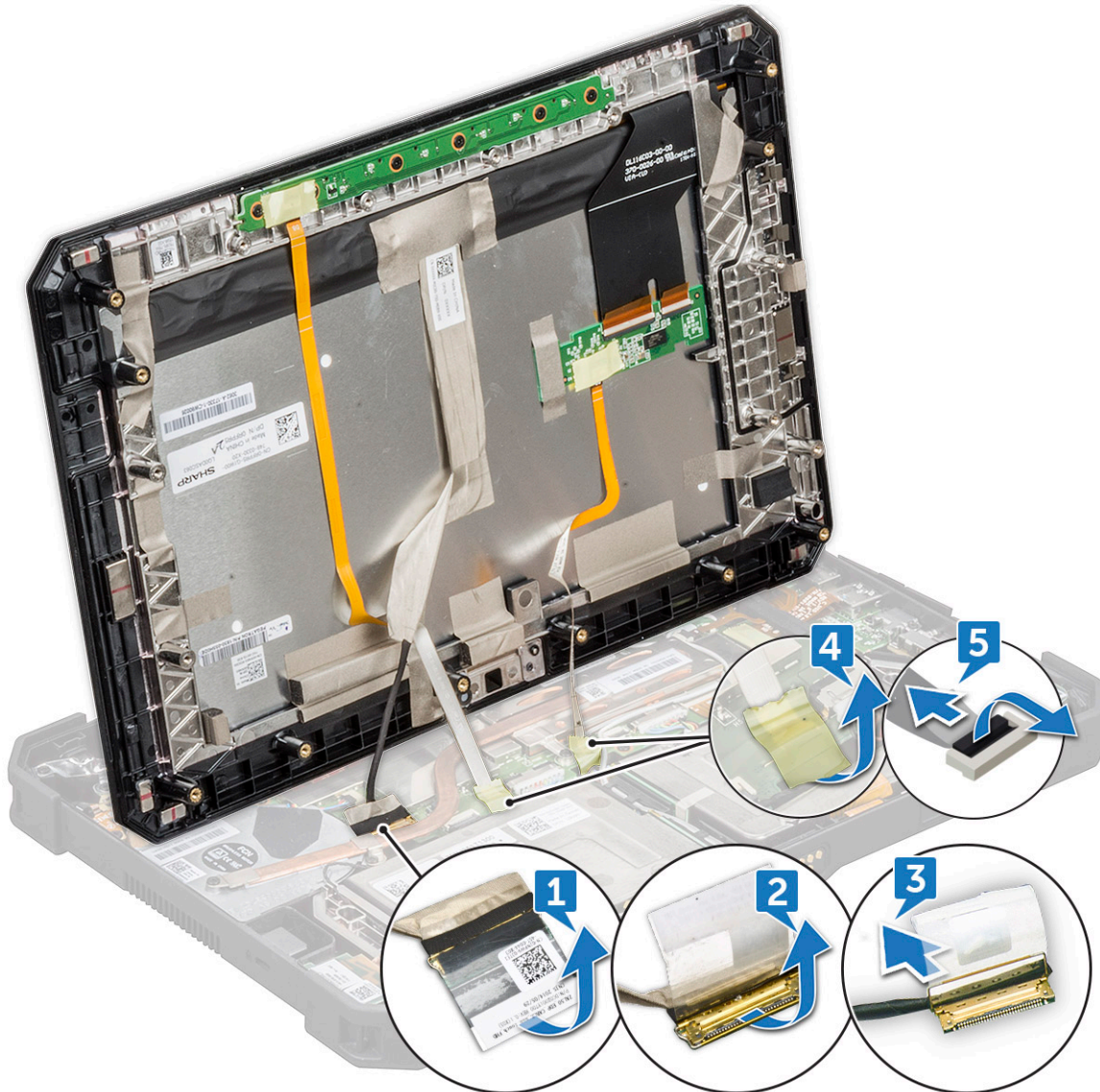
NOTE: Ensure not to flip more than 90° angle, as the display assembly ports and cables are connected to the system board and may damage the display cables.

9. Before removing display assembly:

- a. Place the bottom edge of the display panel inside the bottom edge of the rear chassis.
- b. Flip open the display panel to 90° angle and lay it angled on the tablet chassis.

10. To disconnect the display cable:

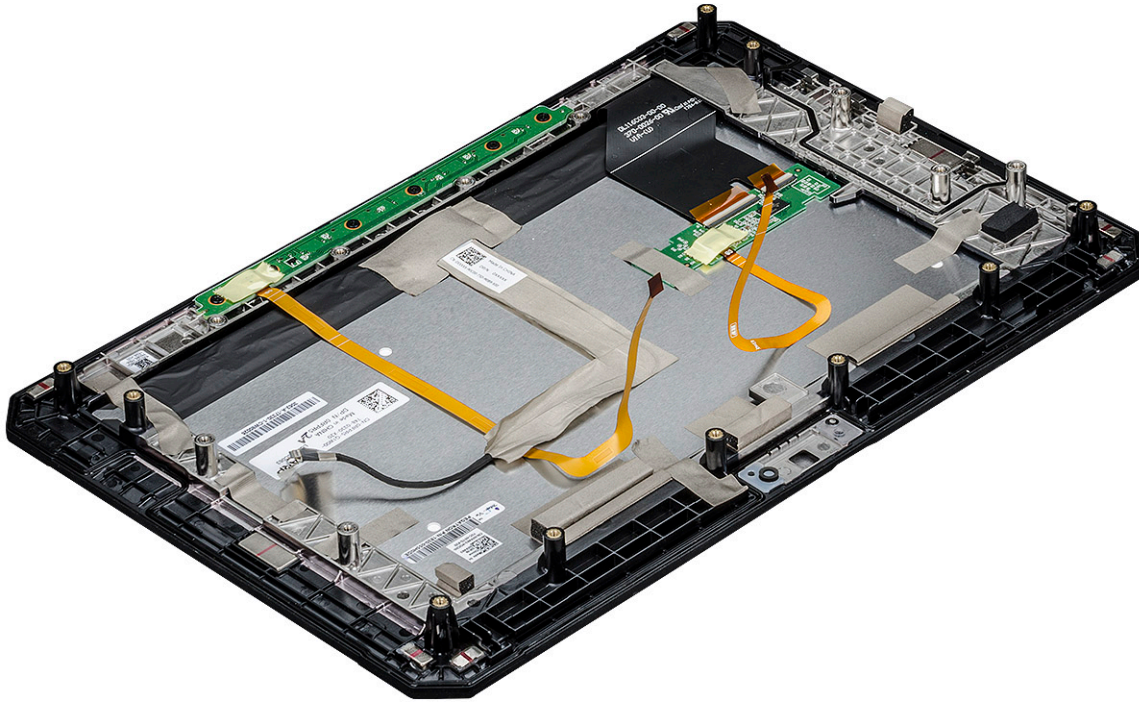
- a. Remove the adhesive tape that secures the LVDS cable on the system board [1].
- b. Lift the latch with a plastic scribe on the system board.
- c. Disconnect the connector of LVDS cable from the slot by a plastic scribe [2] and remove the cable [3].



- d. Remove the adhesive tape that secures the Function Key cable on the system board [4].
- e. Lift the latch by a plastic scribe and release the Touch cable connected to the system board [5].

i **NOTE:** Disconnect only the display cable from the system board. NEVER disconnect the display cable from the display panel.

- 11. Remove the display assembly from the tablet.



NOTE: DO NOT remove any cable or adhesive tape from the display panel, unless you are replacing the cables separately.

Installing display assembly

1. Place the system chassis on a plane surface.
2. Place the bottom edge of the display assembly inside the bottom edge of the rear chassis.
3. Rest the display assembly by less than 90° angle.

NOTE: Use a support to attain the required angle.
4. Connect the touch cable, function keys cable, and LVDS cable to the connector on the system board.
5. Release the latch to secure the cables to the respective connecting ports.

NOTE: Make sure to insert the cable under the clips, if not, the system may not display video after reassembling.
6. Paste the adhesive tapes to secure the connected slots.

NOTE: Ensure to secure the adhesive tapes, to protect the display assembly from electrostatic discharge damage.
7. Align the display assembly on the tablet chassis and press the edges to snap-in.

NOTE:

 - **Ensure that the Window button on the display assembly aligns with the docking pogo pins on the system board chassis.**
 - **Press the edges starting from Windows button clockwise until they snap-in evenly from all sides. Ensure to hear a click sound when the display assembly is aligned in correct position.**
8. Flip the system so that the battery is at top view.

NOTE: Ensure to place the system in a flat surface.
9. Replace the screws (19) to secure the display assembly to the tablet.

NOTE: DO NOT tighten the screws too much, to avoid damage the screws thread.

10. Install the:
 - a. [Battery](#)
11. Follow the procedure in [After working inside your computer](#).

Stylus

Removing stylus

1. Follow the procedure in [Before working inside your computer](#).
2. Locate the stylus at the top of the tablet.
3. Pull the stylus by the thread upward.

NOTE: Avoid pulling the stylus attached with the stretchable thread.



4. Pull the stylus from the groove on the tablet.

NOTE: Pull the stylus until the tip of the pen is visible at the mouth of the groove.

The stylus is ready to assist you in using the rugged tablet.

For more details, see [Getting the stylus ready for use](#)

Installing stylus

1. Align the stylus with the groove on the tablet.
2. Push and smoothly slide it inside to secure the stylus.

NOTE: Avoid hanging the stylus detached from its groove when not in use.

3. Follow the procedure in [After working inside your computer](#).

WLAN card

Removing WLAN card

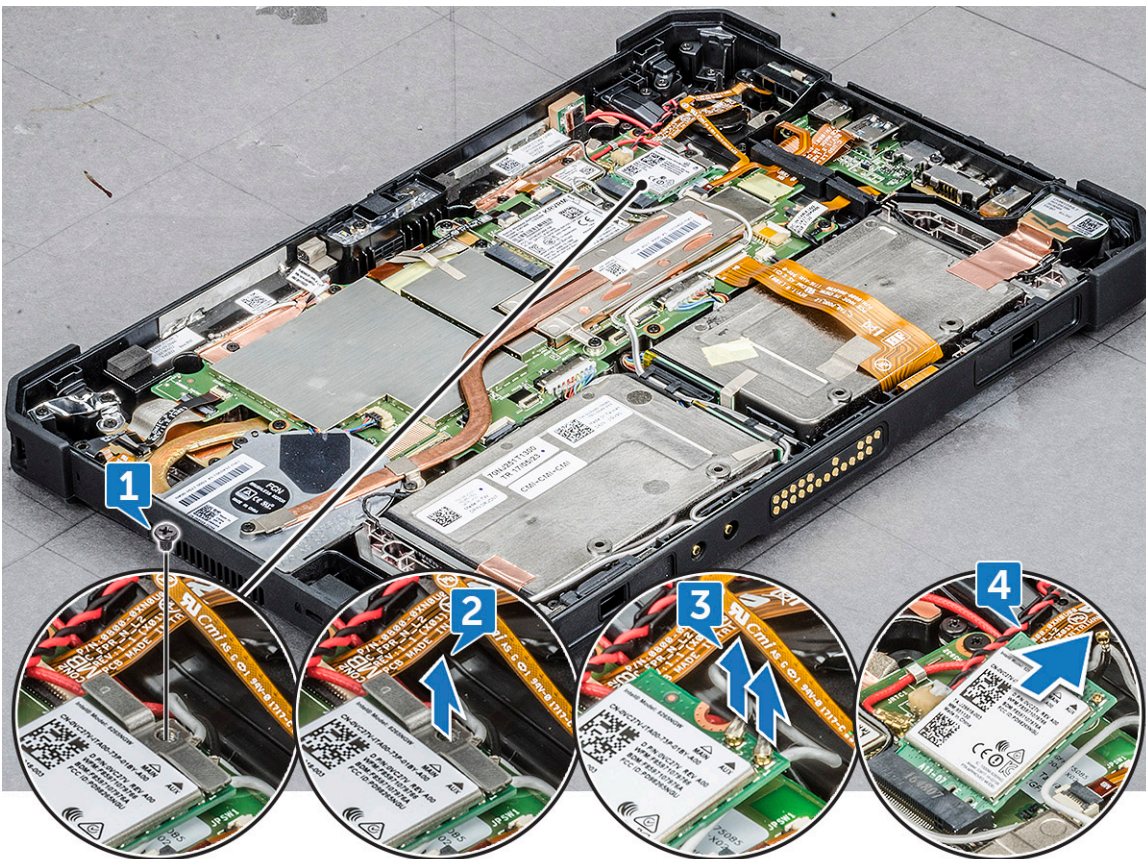
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the:
 - a. [Battery](#)
 - b. [Display assembly](#)
3. To remove the WLAN card:
 - a. Place the back side of system on a flat surface.
 - b. Locate the WLAN card.
 - c. Remove the screw that secures the WLAN bracket to the system board [1].
 - d. Lift the metal bracket [2] from the WLAN card.
 - e. Disconnect the two antenna cables [3] with a plastic scribe.

NOTE: Insert the edge of the plastic scribe between the tiny gap of cable copper head and WLAN card button pin.



- f. Slide and lift the WLAN card from the slot on the system board [4].

NOTE: Ensure to lift the WLAN card by NOT more than 35° angle.

CAUTION: Never touch the metal pins or the circuit with bare hands. Touch at the side of the WLAN card.






Installing WLAN card

1. Insert the WLAN card in the slot on the system board.
 -  **NOTE:** Ensure that the metal pin is downwards towards the slot on the system board, and an angle LESS than 30° is maintained.
2. Connect the WLAN cables to the connectors on the WLAN card.
 -  **NOTE:** Ensure that cables are aligned straight and gently press on the top to fit the cable copper head on WLAN card button pin.
3. To secure the WLAN card, place the antenna bracket and tighten the M2.0 x 3.0 screw.
4. Install the:
 - a. [Display assembly](#)
 - b. [Battery](#)
5. Follow the procedure in [After working inside your computer](#).

WWAN card

Removing WWAN card

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the:
 - a. [Battery](#)
 - b. [Display assembly](#)
3. To remove the WWAN card:
 - a. Place the back side of system on a flat surface.
 - b. Locate the WWAN card.
 - c. Remove the screw that secures the WWAN bracket to the system board [1].
 - d. Lift the metal bracket [2] from the system board.
 - e. Disconnect main and auxiliary cables [3] with a plastic scribe from the connector on the WWAN card.
 -  **NOTE:** Insert the edge of the plastic scribe between the tiny gap of cable copper head and WWAN card button pin.
 - f. Slide and lift the WWAN card from the slot on the system board [4].
 -  **NOTE:** Ensure to lift the WWAN card by an angle NOT more than 35°.
 -  **CAUTION:** Never touch the metal pins or the circuit with bare hands. Touch at the side of the WWAN card.



Installing WWAN card

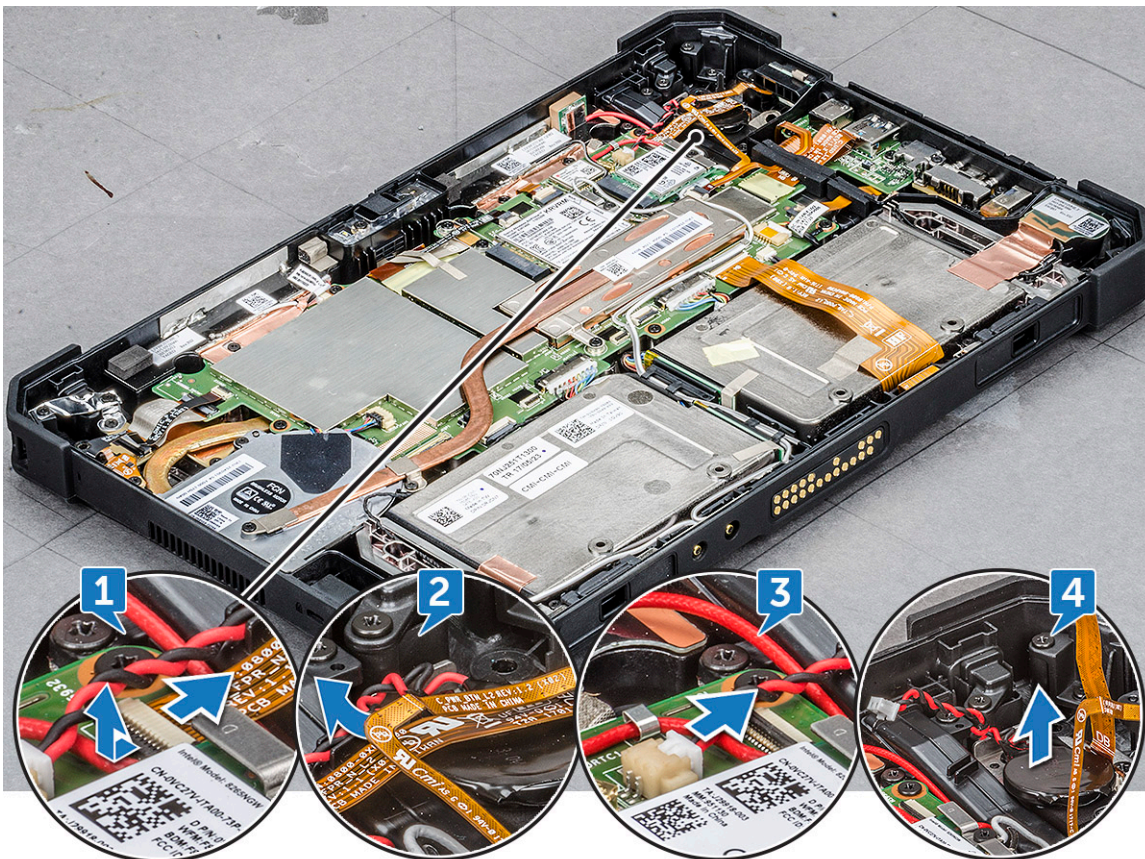
1. Insert the WWAN card in the slot on the system board.
 - NOTE:** Ensure that the metal pin is downwards towards the slot on the system board.
2. Connect the WWAN cables to the connectors on the WWAN card.
 - NOTE:** The IMEI number is visible on the WWAN card.
3. To secure the WWAN card, place the metal bracket and tighten the M2.0 x 3.0 screw.
4. Install the:
 - a. [Display assembly](#)
 - b. [Battery](#)
5. Follow the procedure in [After working inside your computer](#).

CMOS battery

Removing CMOS battery

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the:
 - a. [Battery](#)
 - b. [Display assembly](#)
3. To remove the CMOS battery:
 - a. Place the back side of system on a flat surface.

- b. Locate the CMOS battery.
- c. Lift the fingerprint reader cable latch by a plastic scribe and push the cable gently from the latch [1].
 - i** **NOTE:** Ensure to unlock the fingerprint reader cable to release the CMOS battery.
- d. Remove the CMOS cable from the routing clip on the system board [2].
- e. Push the pin connected to the system board CMOS slot by a plastic scribe [3].
 - i** **NOTE:** Push the cable pin head with a plastic scribe at an angle not more than 30°. DO NOT push too hard, as it may damage the cable pin head.
- f. Lift the CMOS battery from the adhesive tape [4].
 - i** **NOTE:** Ensure not to pull the CMOS battery upwards as it is positioned beneath the fingerprint reader cable. Gently release the battery from the adhesive tape.



- i** **NOTE:** Replace the CMOS battery when **checksum** error is displayed in booting.


Installing CMOS battery

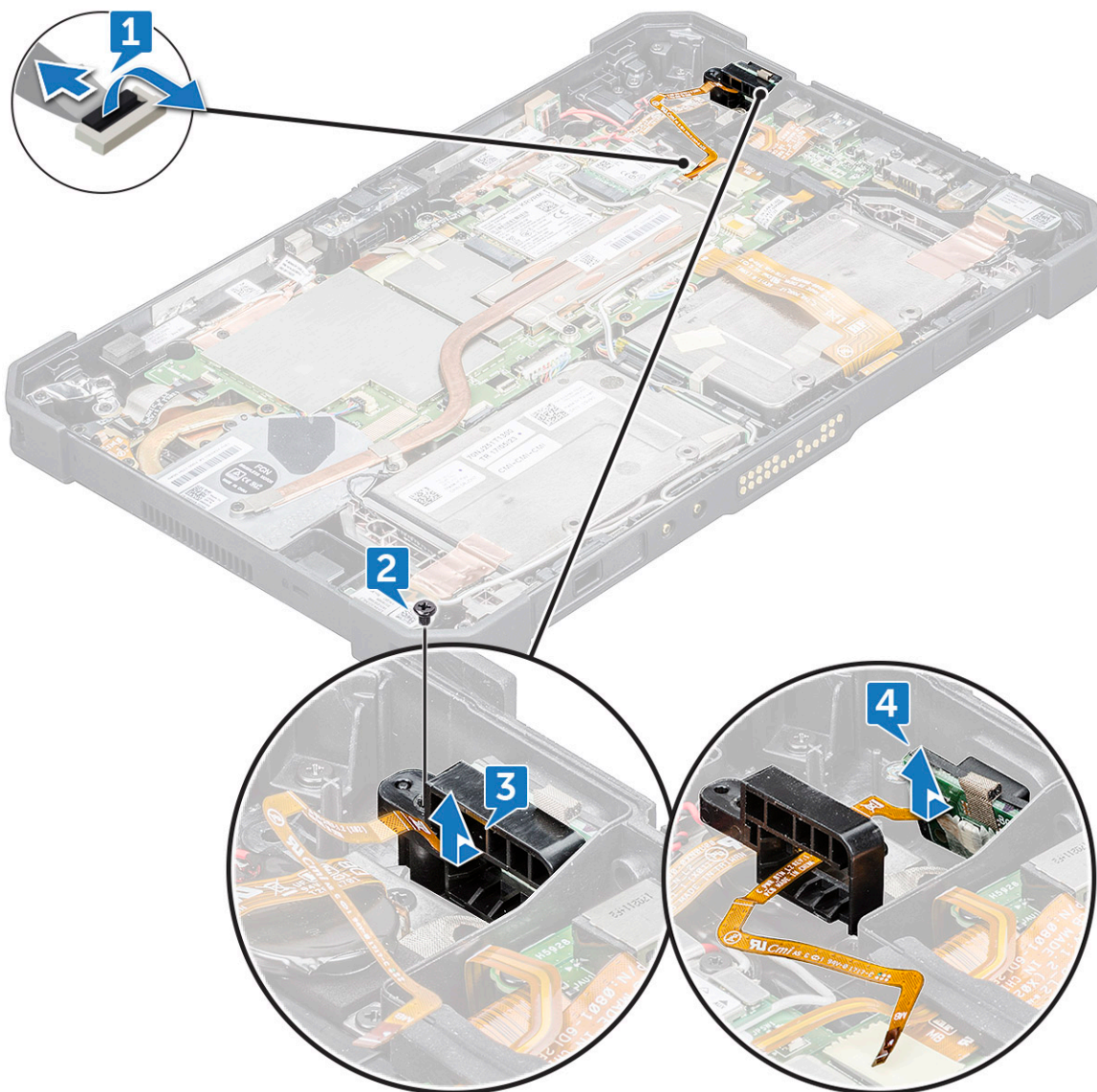
1. Align the CMOS battery over the rubber pad on top of the fingerprint reader.
2. Press the CMOS battery on the adhesive tape.
 - i** **NOTE:** CMOS battery for the tablet is insulated in a protective shield. To avoid poor connection of the wire with battery, NEVER tear the protective shield.
3. Connect the CMOS battery cable to the slot on the system board.
4. Slide the fingerprint reader cable beneath the latch and close the latch.
 - i** **NOTE:** Install the CMOS battery cable, and then connect the fingerprint reader cable.
5. Install the:

- a. [Display assembly](#)
 - b. [Battery](#)
6. Follow the procedure in [After working inside your computer](#).

Power button assembly

Removing power button assembly

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the:
 - a. [Battery](#)
 - b. [Display assembly](#)
3. To remove the power button assembly:
 - a. Place the back side of system on a flat surface.
 - b. Locate the power button assembly.
 - c. Lift the latch by an angle 35° to unlock and gently release the power button assembly cable [1].
 - d. Remove the screw (1) that secures the power button assembly to the system board [2].
 **NOTE:** DO NOT try to remove the power assembly without removing the screw.
 - e. Push with plastic scribe, and pull the power button bracket [3].



NOTE: Power button assembly bus cable is routed between the square gap in the power button bracket.

- f. Release the adhesive tape that secures the power button assembly.
- g. Push and release the power button assembly from the chassis by a plastic scribe [4].
- h. Lift and remove the power button bracket together with the power button assembly.

NOTE: Power button is encapsulated within a power button bracket.

Installing power button assembly

1. Assemble the power assembly button with the power button bracket.

NOTE: Ensure that the power button cable is routed between the square gap in the power button bracket.

2. Push the power button assembly in the slot on the tablet chassis.




NOTE: Ensure NOT to insert the power button from the exterior right view.

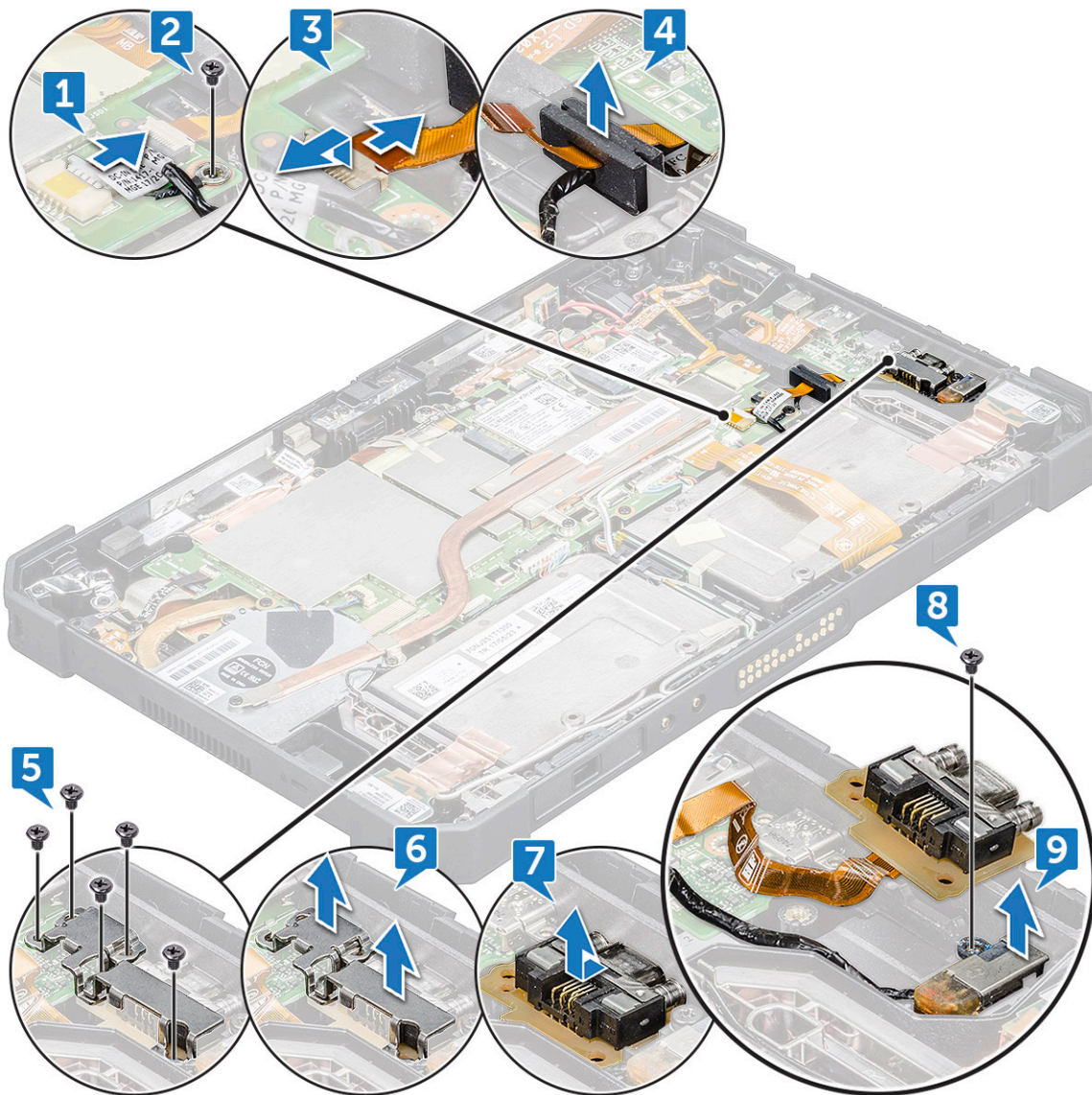
3. Secure the power button assembly with the adhesive tape.
4. Replace the screw to secure the power button assembly to the tablet chassis.
5. Connect the power button assembly cable, and close the latch on the system board.

6. Install the:
 - a. [Display assembly](#)
 - b. [Battery](#)
7. Follow the procedure in [After working inside your computer](#).

Micro serial port and power connector port

Removing micro serial port and power connector port

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the:
 - a. [Battery](#)
 - b. [Display assembly](#)
3. To remove the micro serial port and power connector port:
 - a. Place the back side of system on a flat surface.
 - b. Locate the micro serial port and power connector port.
 - c. Push to disconnect the power connector cable [1] and remove the screw that secures power connector cable to the system board [2].
 - d. Lift the latch and disconnect the micro serial port cable from the connector [3].
 - e. Lift the rubber bracket upward that secures the cable with system chassis [4].
 **NOTE:** Ensure to release the bracket, after the micro serial port cable is connected.
 - f. Remove the metal bracket screws (5) that secure the micro serial port and USB-C port to the system chassis [5].
 **NOTE:** Ensure to remove USB-C bracket in order to remove the micro serial port.
 - g. Lift the micro serial port bracket first, then the USB-C port bracket from the system [6].
 - h. Lift the micro serial port and power connector port on the system board [7].
 **NOTE:** The micro serial port is still attached to the power connector port, lift only enough to set it aside in order to remove the power connector port screw
 - i. Remove the screw (1) that secures the power connector port and lift the power connector port along with the micro serial port from the system board [8,9].



Power connector port and micro serial port are assembled as one single component to connect on the tablet system board.



NOTE: Malfunction of either component requires to remove both power connector port and micro serial port.

Installing micro serial port and power connector port

1. Insert the power connector port and micro serial port into the slot on the chassis.
2. Align the metal brackets that secure the ports on the system chassis.
 - i** **NOTE:** The USB-C port bracket is followed by the micro serial port bracket, as the micro serial port bracket sits on top of the USB-C port bracket with screw (1).
3. Replace the screws (5) to secure the micro serial port and power connector port to the chassis.
4. Align the rubber bracket and push to slide in the channel .
 - i** **NOTE:** Rubber bracket ensures to secure the micro serial port cable from damage.
5. Insert the micro serial port cable into the connector.
6. Close the latch to secure the micro serial port cable to the system board.
7. Align the power connector port cable to the system board and affix the ground wire with the screw (1) to the system board.
8. Install the:
 - a. [Display assembly](#)
 - b. [Battery](#)
9. Follow the procedure in [After working inside your computer](#).

Front camera

Removing front camera

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the:
 - a. [Battery](#)
 - b. [Display assembly](#)
3. To remove the front camera:
 - a. Place the back side of system on a flat surface.
 - b. Locate the front camera.
 - c. Slide the camera shutter towards right, to bring the lens cover is in the open position [1].
 - d. Insert the edge of the plastic scribe between the gap of lens shutter and lift camera lens shutter [2].



- e. Remove the screws (2) that secure the camera on the system chassis [1].
- f. Lift the lens case at the edge to insert the plastic scribe in the gap and lift the lens case by an angle not more than 35° and push upward to release the camera lens case [2].



- g. Flip the camera circuit board with a plastic scribe [1].
- h. Disconnect the camera cable that secures the cable to the system board [2].



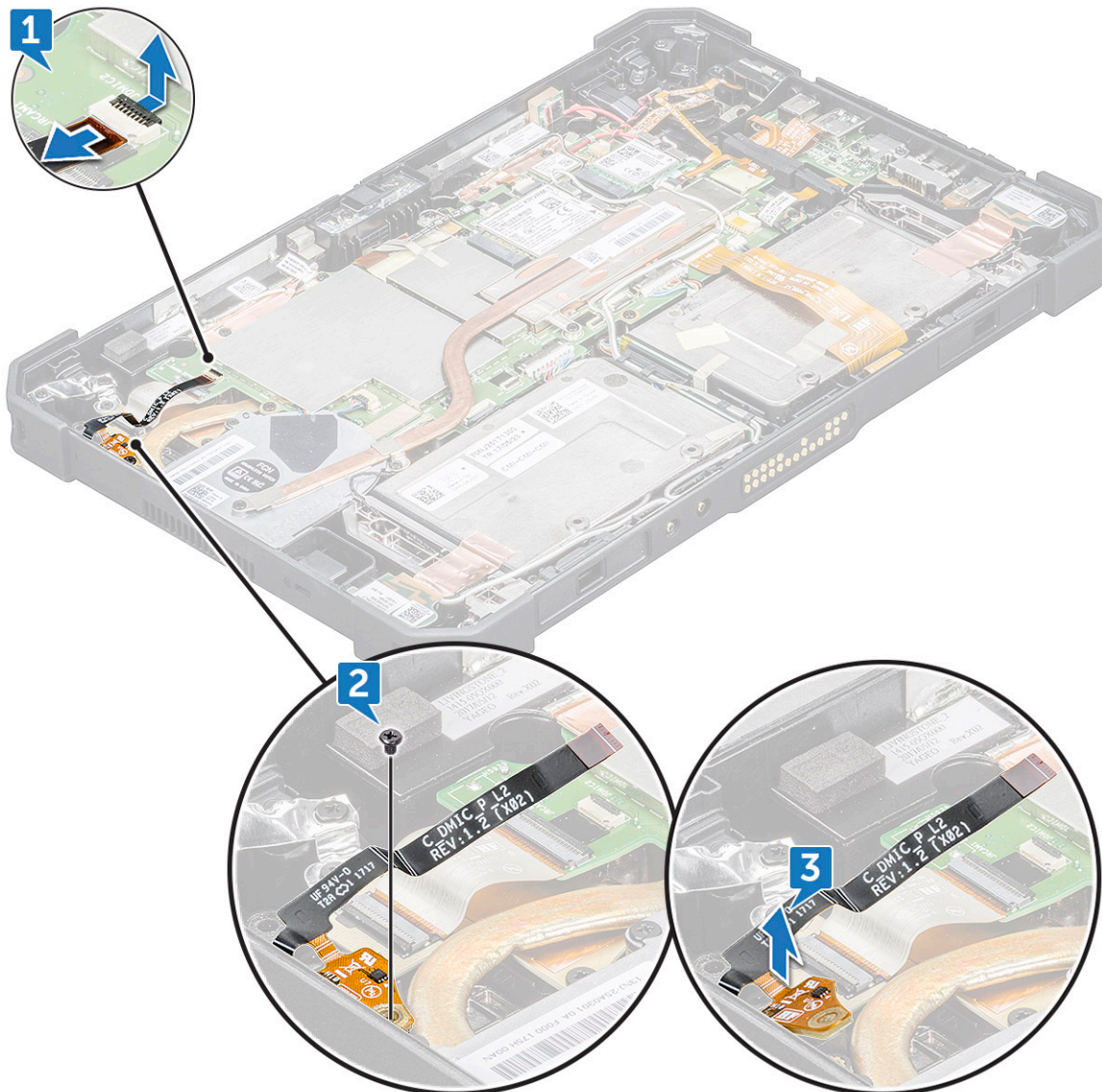
Installing front camera

1. Align the front camera circuit board over the camera chassis.
 - i** **NOTE:** Opposite side of the camera circuit board is placed to connect cable in the connector.
2. Connect the front camera cable and plug in the cable to the connector.
3. Flip the front camera circuit board, and align front camera circuit board with screw hole.
4. Align the camera lens case to the camera placeholder.
5. Replace the screw to secure the front camera circuit board on the system board.
6. Slide the lens shutter in the lens channel and push towards left.
7. Install the:
 - a. [Display assembly](#)
 - b. [Battery](#)
8. Follow the procedure in [After working inside your computer](#).

Microphone

Removing microphone

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the:
 - a. [Battery](#)
 - b. [Display assembly](#)
3. To remove the microphone:
 - a. Place the back side of system on a flat surface.
 - b. Locate the microphone.
 - c. Lift the latch and gently release the power microphone cable [1].
 - d. Remove the screws (2) that secures the integrated microphone assembly circuit board and microphone bracket that hold the microphone to the system board [2].
 - i** **NOTE:** Ensure to remove the screw of the bracket which hold the microphone when the microphone circuit board is aligned. Non-removal of the bracket can damage the rubber seal.
 - e. Release the microphone assembly and, lift the microphone form the tablet chassis [3].



NOTE: NEVER pull the microphone by the cable. In case the circuit board is not released smoothly, push from below the microphone circuit board by a plastic scribe.

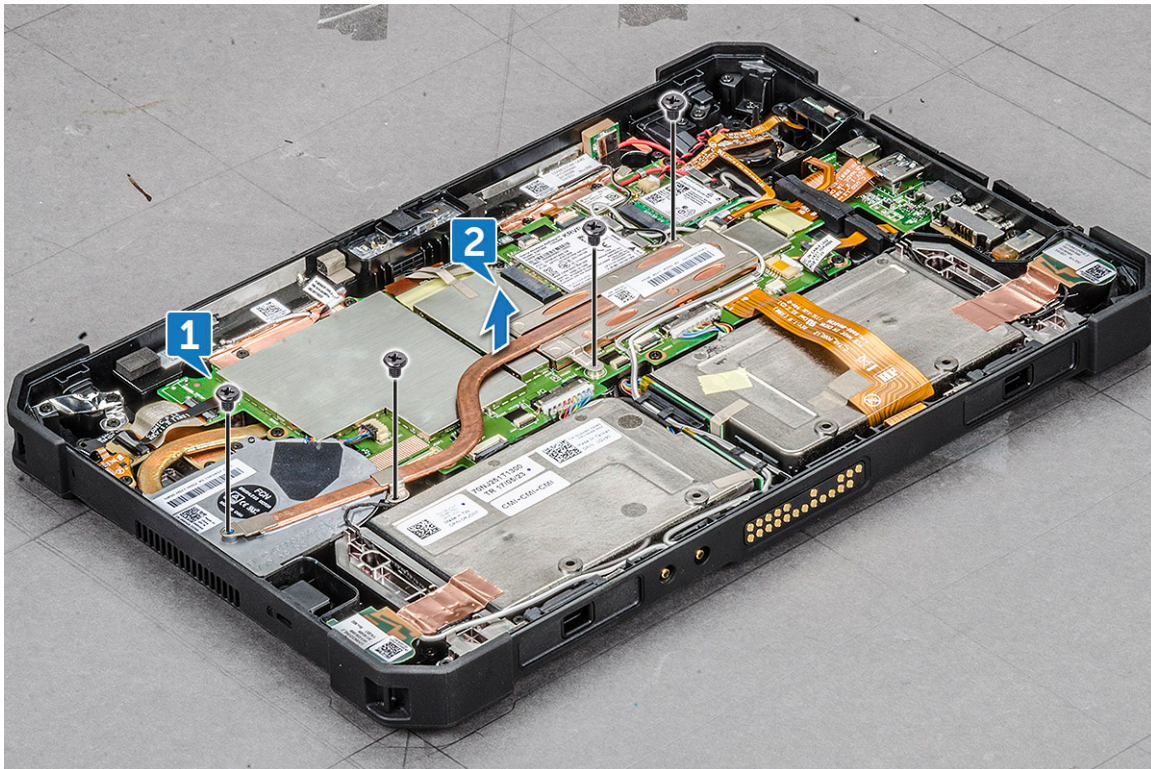
Installing microphone

1. Align the microphone system board on the tablet chassis.
2. Align the microphone input in the slot on the chassis, with the microphone input against the tablet chassis
3. Replace the bracket behind and against the microphone input and replace the screw (1) in the bracket to secure the microphone to the tablet chassis.
4. Align the microphone IC board on the chassis and replace the screw (1) to secure the IC board to the chassis.
5. Slide the microphone bus cable in the port on system board and close the latch to secure the cable.
6. Install the:
 - a. [Display assembly](#)
 - b. [Battery](#)
7. Follow the procedure in [After working inside your computer](#).

Heat sink for SSD

Removing heatsink for SSD or PCIE

1. Follow the procedure in [Before working inside your computer](#).
 2. Remove the:
 - a. [Battery](#)
 - b. [Display assembly](#)
 3. To remove the heatsink:
 - a. Place the back side of system on a flat surface.
 - b. Locate the heatsink.
 - c. Remove the screws (4) securing the heatsink on the system board [1].
 - d. Lift the heat sink from the outlet connected on the heatsink fan and the system board [2].
- NOTE:** The thermal pad attached to the heatsink stick to the fan and SSD. Applying strong force can bend the heatsink while lifting the heatsink from the system.



CAUTION: When the system has been on or in use, the surface of the heat sink may be hot. Ensure to lift the heat sink cautiously when the heatsink cools.

CAUTION: DO NOT bend or damage the copper heat sink tunnel. Any damage results in malfunction and over heating of the tablet.

Installing heatsink for SSD or PCIE

1. Align the heatsink on the system board.

NOTE: Ensure the [SSD card](#) is connected in the slot on the system board.

NOTE: Do ensure thermal pad is applied in the heatsink and the heatsink is not damaged. If the heatsink is reused, ensure not to damage while removal.

2. Replace the screws (4) to secure the heatsink to the tablet chassis.
3. Install the:
 - a. [Display assembly](#)
 - b. [Battery](#)
4. Follow the procedure in [After working inside your computer](#).

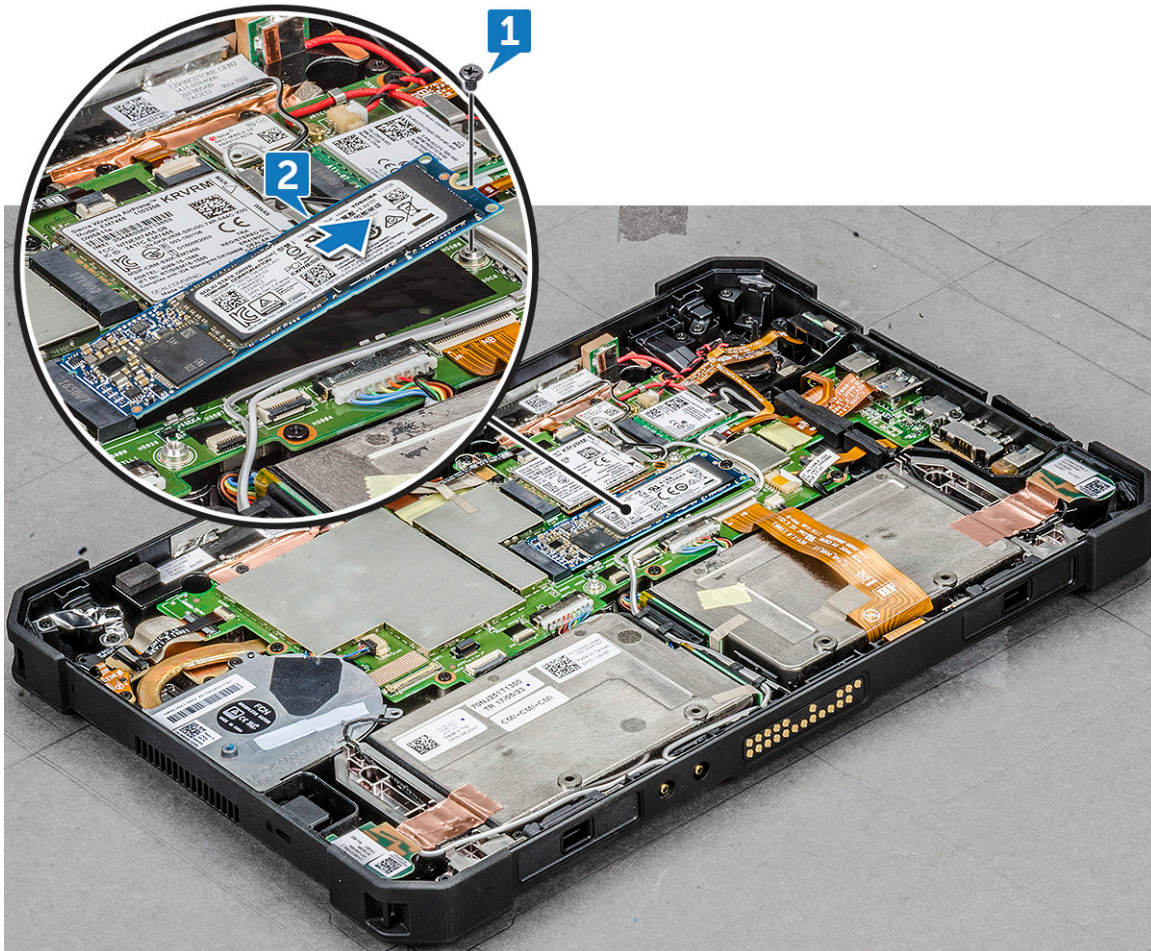
PCIe Solid State Drive (SSD)

Removing PCIe Solid State Drive - SSD

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the:
 - a. [Battery](#)
 - b. [Display assembly](#)
 - c. [Heat sink](#)

3. To remove the SSD:
 - a. Place the back side of system on a flat surface.
 - b. Locate the SSD.
 - c. Remove the screws (1) that secures the SSD on the system board [1].
 - d. Slide and lift the SSD card from the connector on the system board [2].

NOTE: Ensure to lift the SSD card by an angle NOT more than 30°.



CAUTION: Lift the SSD card by the side. DO NOT touch the circuit.

Installing PCIe Solid State Drive - SSD

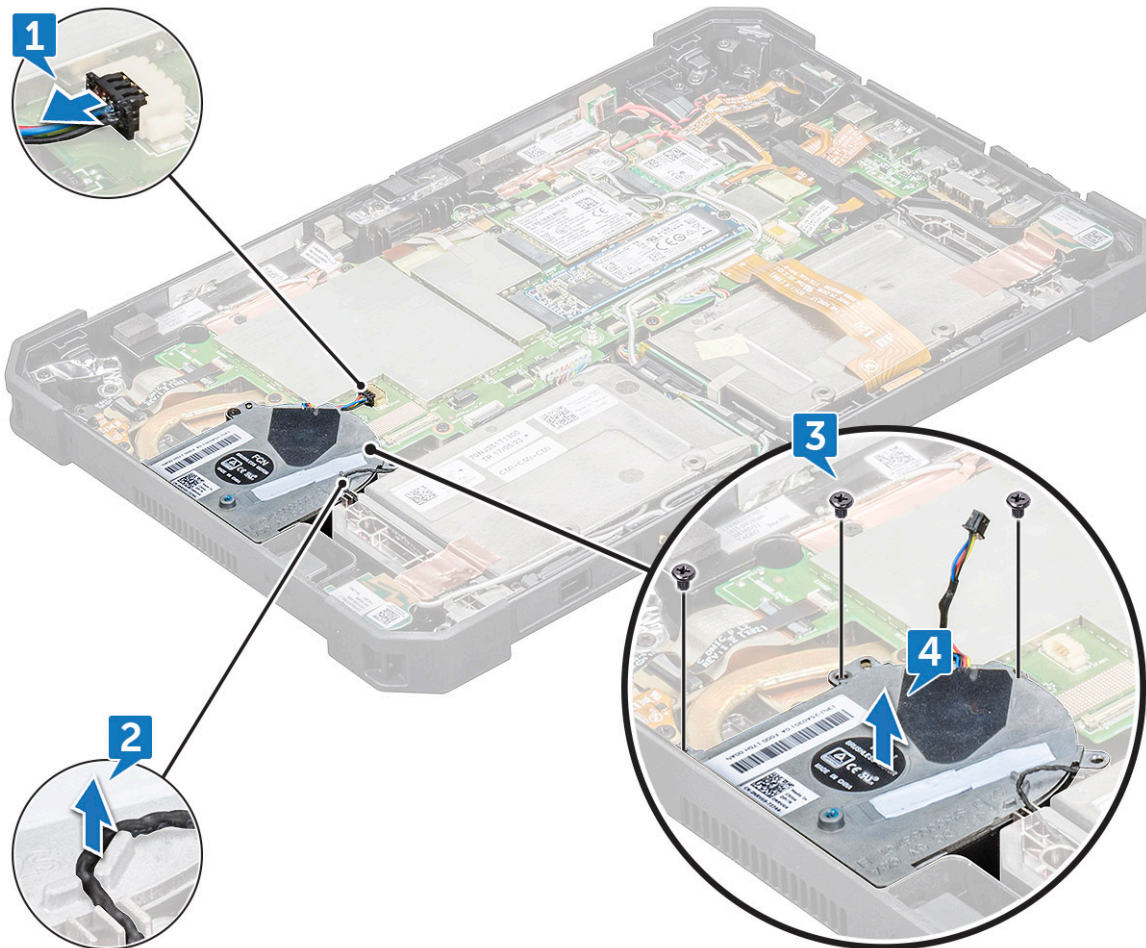
1. Slide and insert the SSD module in the connector on the system board.

NOTE: Ensure that the IC on the SSD module is positioned upward in the connector on the system board. Do ensure to insert the SSD module by an angle not more than 30° to 35°.
2. Replace the screw (1) to secure the SSD module to the tablet chassis.
3. Install the:
 - a. Heat sink
 - b. Display assembly
 - c. Battery
4. Follow the procedure in [After working inside your computer](#).

System fan

Removing system fan

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the:
 - a. [Battery](#)
 - b. [Display assembly](#)
 - c. [Heat sink](#)
3. To remove the system fan:
 - a. Locate the system fan.
 - b. Release the cable that connects the system fan on the system board with a plastic scribe [1].
i **NOTE:** Push the bulge edge of the system fan connector by a plastic scribe.
 - c. Remove the speaker cable from the routing channel [2].
 - ⚠ CAUTION:** Ensure to unroute the cable, to avoid damaging the cable and cable connector.
 - d. Remove the screws (4) that secure the system fan on the system board [3].



Installing system fan

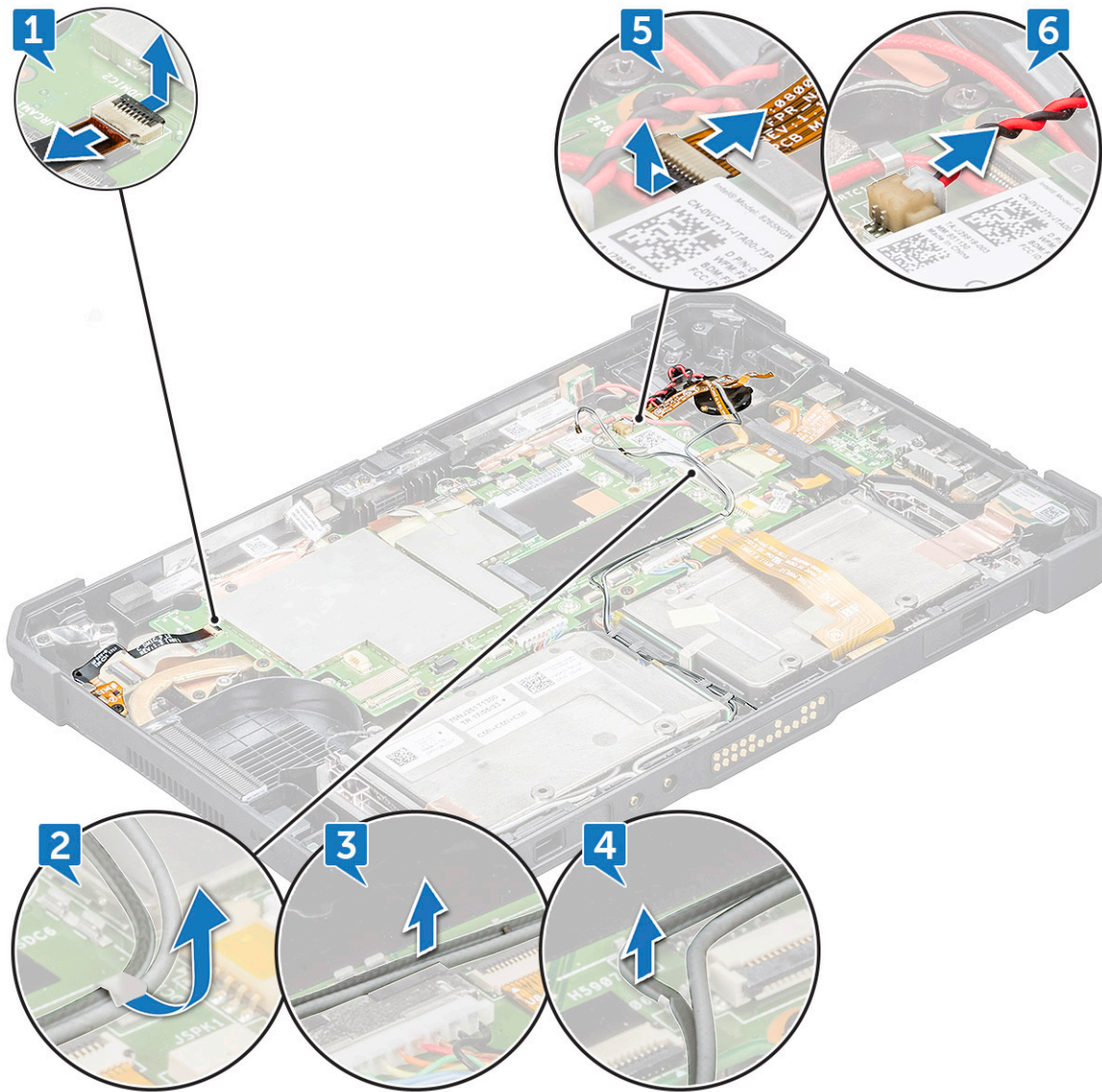
1. Align the system fan in the slot on the system chassis.
2. Route the speaker cable through the routing channel.

3. Replace the screws (4) to secure the system fan to the tablet chassis.
4. Connect the system fan cable to the system board.
5. Install the:
 - a. [Heat sink](#)
 - b. [Display assembly](#)
 - c. [Battery](#)
6. Follow the procedure in [After working inside your computer](#).

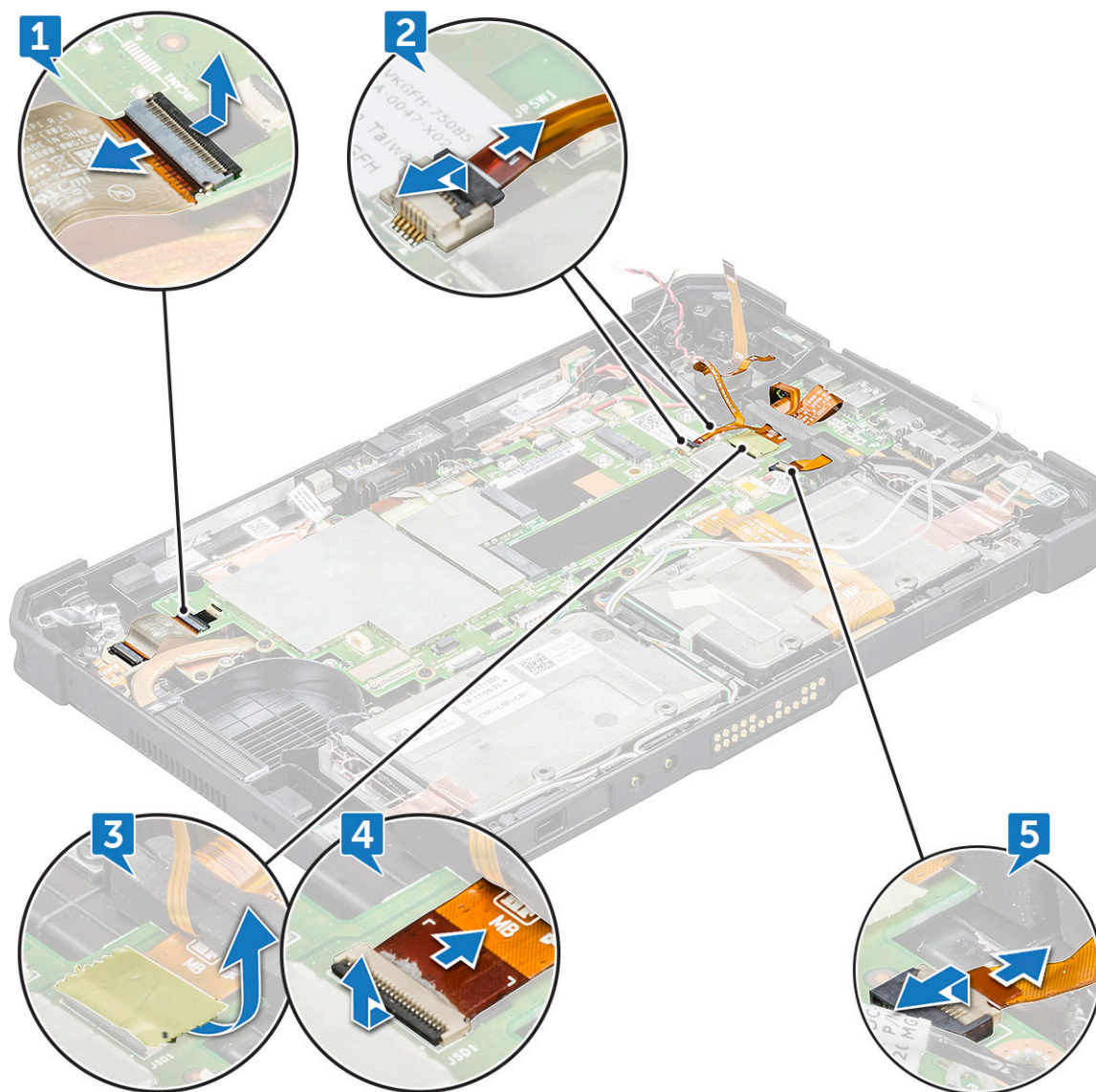
System Board

Removing system board

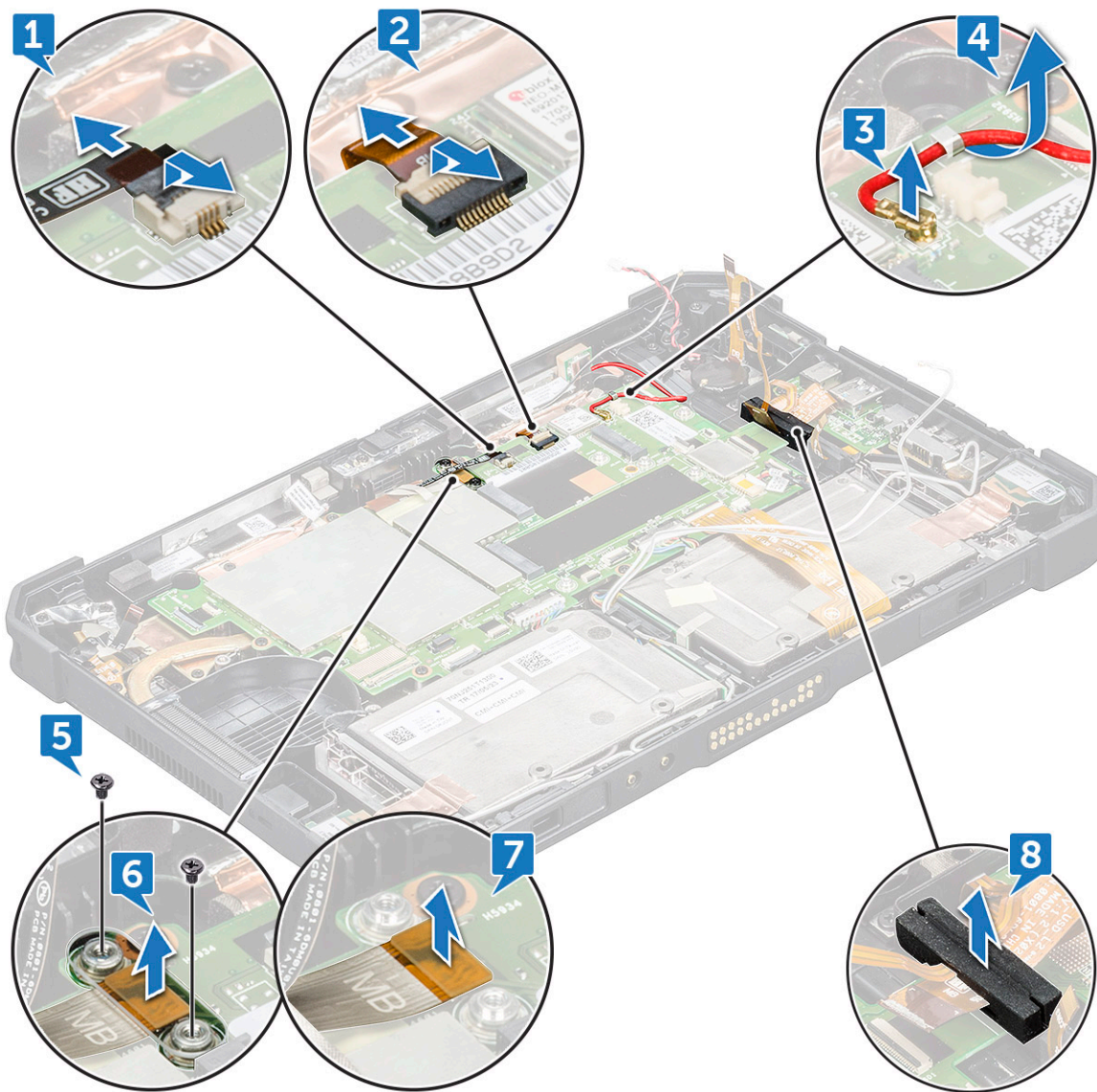
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the:
 - a. [Battery](#)
 - b. [Micro SIM](#)
 - c. [Display assembly](#)
 - d. [Heat sink](#)
 - e. [SSD](#)
 - f. [System fan](#)
 - g. [WLAN](#)
 - h. [WWAN](#)
3. Perform the following before removing the system board:
 - a. Place the back side of system on a flat surface.
 - b. Lift the latch, and disconnect the microphone cable from the system board [1].
 - c. Remove the radio antennae cable from the routing clip with a plastic scribe on the system board [2],[3],[4].
 - d. Lift the latch, and remove the fingerprint reader cable [5].
 - e. Remove the CMOS battery cable from the connector on the system board [6].



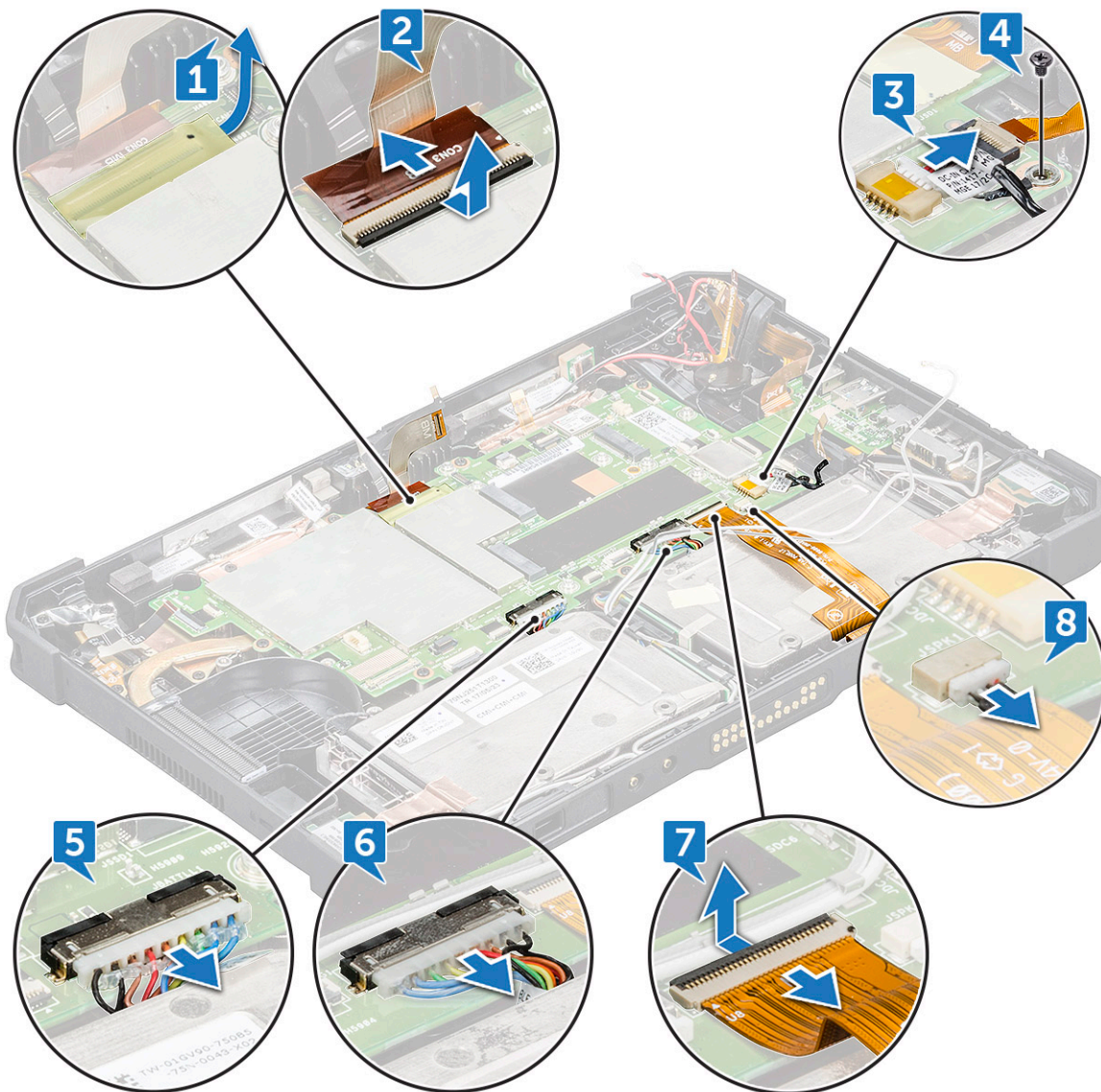
- f. Lift the latch, and remove the back camera cable [1].
- g. Disconnect the power button cable and NFC cable with a plastic scribe on the system board [2].
- h. Remove the adhesive tape that insulates the micro SD card reader cable [3].
- i. Lift the latch, and slide to remove the micro SD card reader cable [4].
- j. Lift the latch, and remove the micro serial port cable from the connector [5].



- k. Disconnect the microphone latch, and remove the cable [1].
- l. Disconnect the smart card reader latch, and remove the cable [2].
- m. Disconnect the cable [3], and remove the cable from the routing clip [4].
- n. Remove the screws(2) that secures the front camera cable [5].
- o. Remove the bracket that covers the front camera cable [6].
- p. Lift and remove the front camera cable from the connector [7].
- q. Release and gently pull the NFC contactless smart card and smart card cable through the narrow slit in the rubber gasket [8].



- r. Remove the adhesive tape protecting the docking board cable connector [1].
- s. Lift the latch, and slide to remove the docking board cable on the system board [2].
- t. Push with a plastic scribe to release the DC-in cable [3], and remove the screw (1) that secures the power connector assembly cable [4].
- u. Disconnect the battery 1 cable from the connector [5].
 - i** **NOTE:** Push on the connector pin head evenly to securely remove the battery cable.
- v. Disconnect the battery 2 cable from the connector [6].
- w. Lift the latch with a plastic scribe, and remove the pogo pin docking cable [7].
- x. Disconnect the speaker cable with a plastic scribe [8].

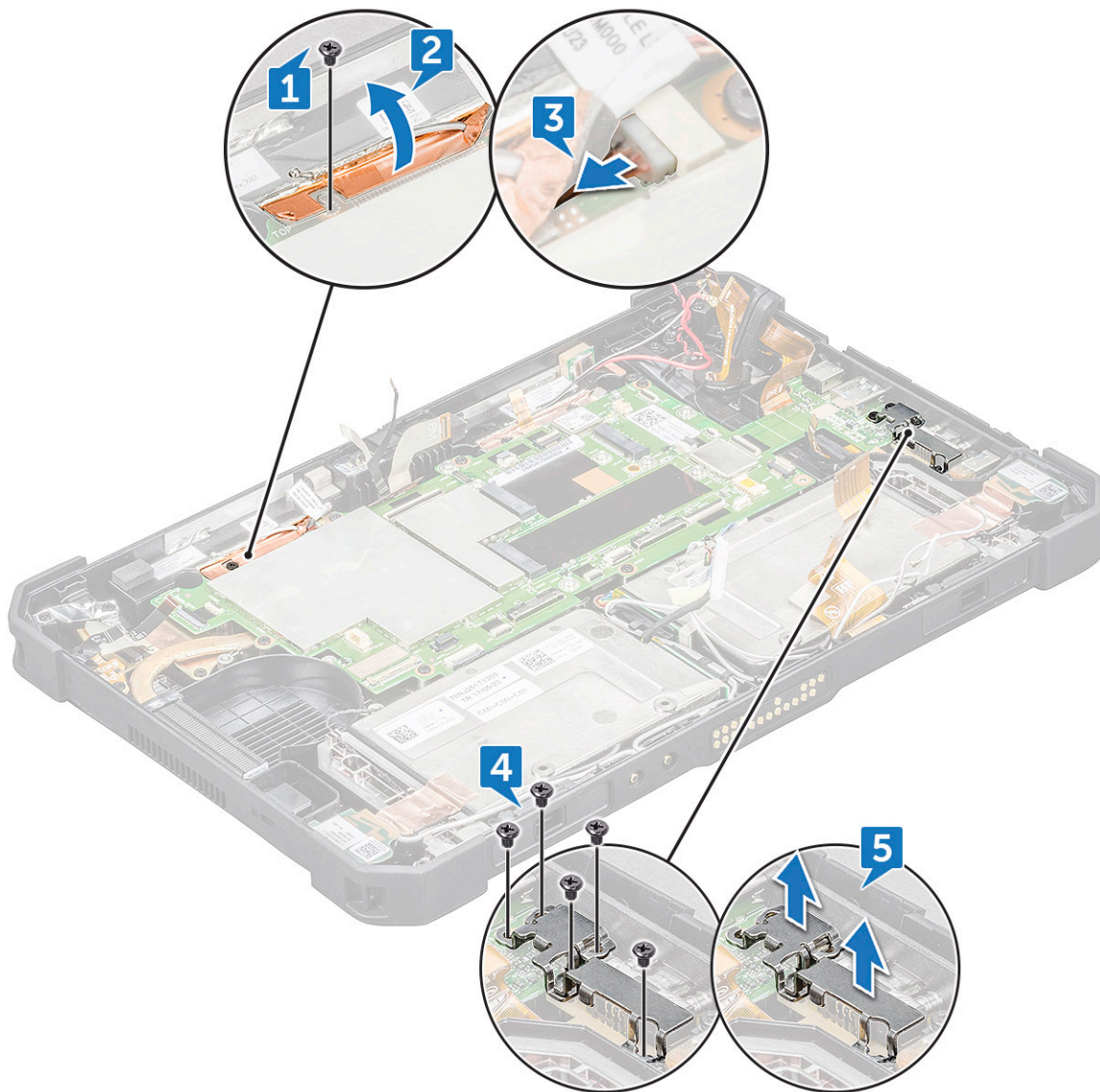


CAUTION: Speaker cable is accessible after you remove the pogo pin docking connector cable. Ensure to remove pogo pin docking cable before removing speaker cable.

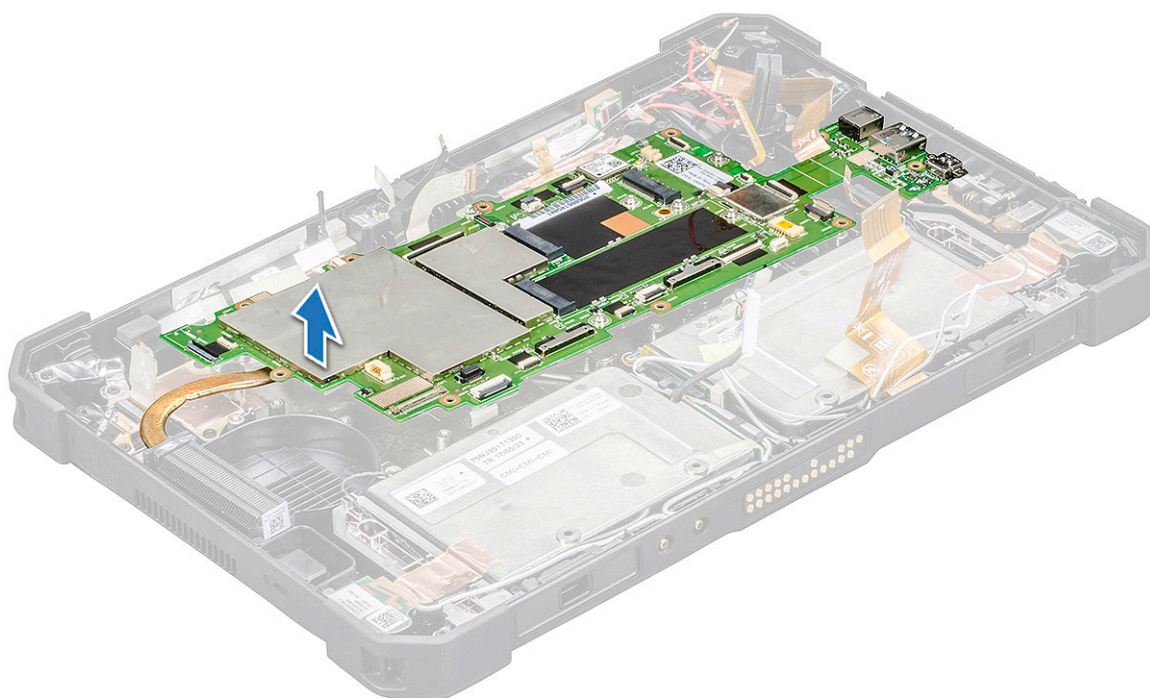
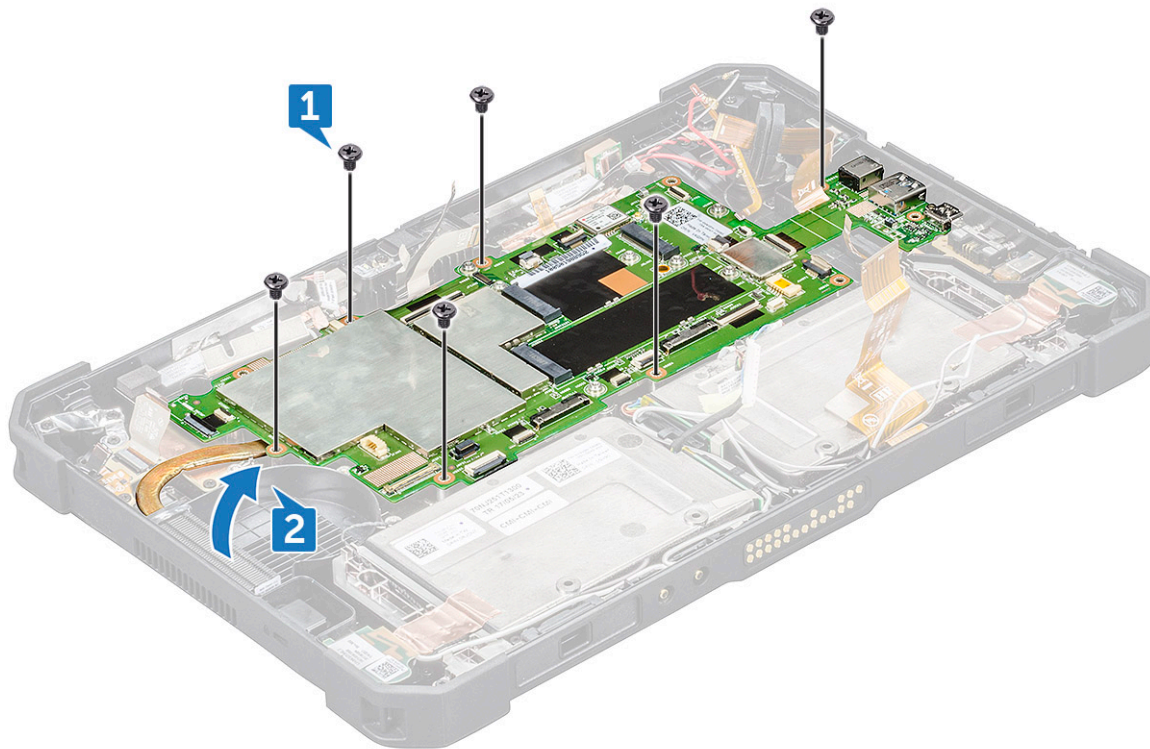
4. To remove the system board:
 - a. Remove the screw (1) that connects the antennas for radio pass-through connectors on the system board [1].
 - b. Flip the connector upward [2].

NOTE: Avoid peeling off the copper shield, and ensure not to flap the copper shield by more than 75°.
 - c. Disconnect the antennas for radio pass-through connectors cable on the system board with a plastic scribe [3].
 - d. Remove the screws (5) that secures the micro serial port, and USB Type-C port metal bracket [4].
 - e. Lift the metal bracket from the system chassis [5].

NOTE: Metal bracket are secured with 5 screws. Lift both the brackets.



- f. Remove the screw (7) that secures the system board to the tablet chassis [1].
- g. Insert the plastic scribe near the system fan screw slot, and slide to release and lift the system board from the tablet chassis [2].



NOTE: Ensure all connected cables are disconnected prior to lifting the system board.

Installing system board

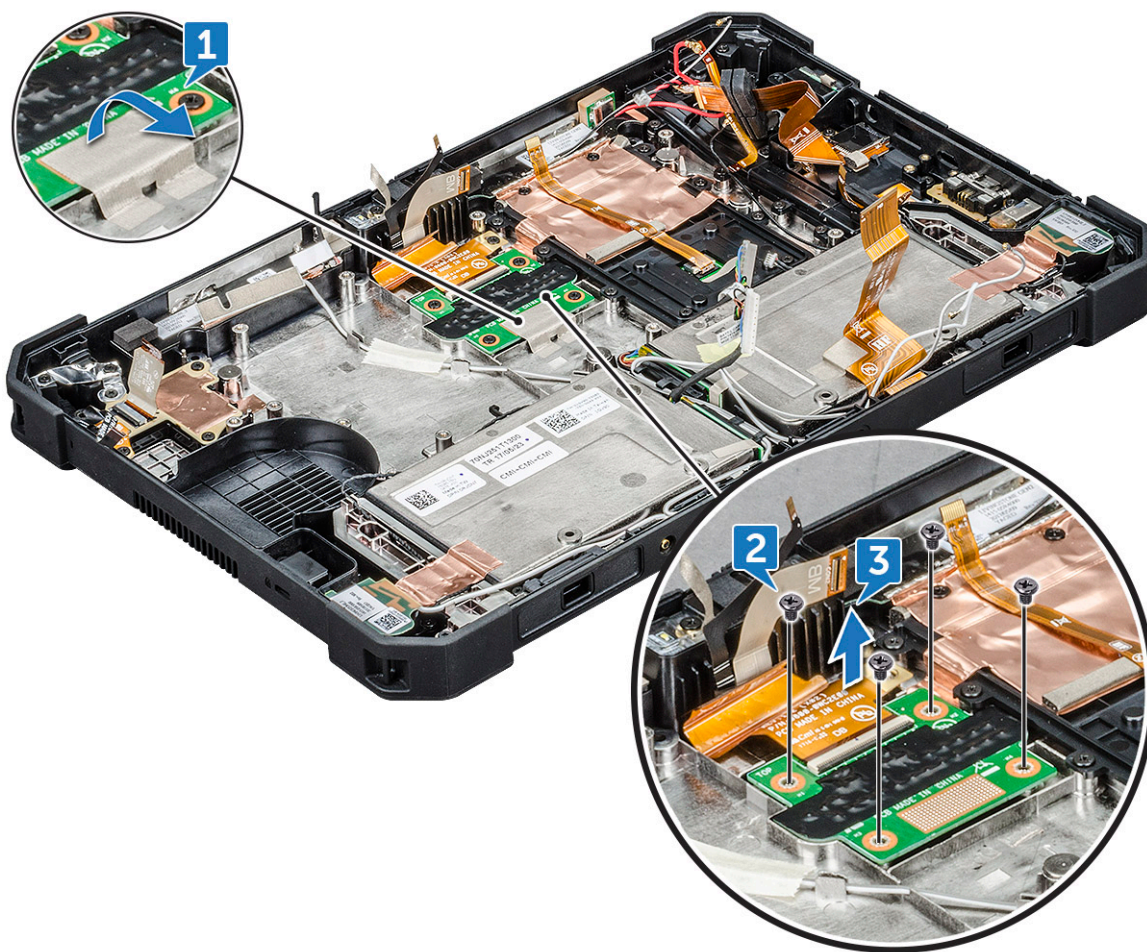
1. Align the system board with the screw holes on the tablet chassis.
2. Replace the screws (7) to secure the system board to the tablet chassis.

3. Connect the cables to respective slot that were disconnected while removing the system board. See [removing system board](#)
4. Install the:
 - a. [WWAN](#)
 - b. [WLAN](#)
 - c. [System fan](#)
 - d. [Heat sink](#)
 - e. [Display assembly](#)
 - f. [SSD](#)
 - g. [Battery](#)
 - h. [Micro SIM](#)
5. Follow the procedure in [After working inside your computer](#).

Docking Board

Removing docking board

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the:
 - a. [Battery](#)
 - b. [Display assembly](#)
 - c. [Heat sink](#)
 - d. [System fan](#)
 - e. [WLAN](#)
 - f. [WWAN](#)
 - g. [System board](#)
3. To remove the docking board:
 - a. Remove the adhesive tape that secures the docking circuit board on the system chassis [1].



- b. Remove the screws (4) that secures the docking circuit board on the system board chassis [2].
 - NOTE:** As the docking board is positioned beneath the system motherboard, ensure to remove the system motherboard, to replace a faulty docking board.
- c. Lift the latch, and slide to remove the docking board cable on the system board [3].

Ensure to remove all components, to resolve issues in bottom base assembly when troubleshooting issues not resolved by replacing the FRU-CRU components.

Installing docking board

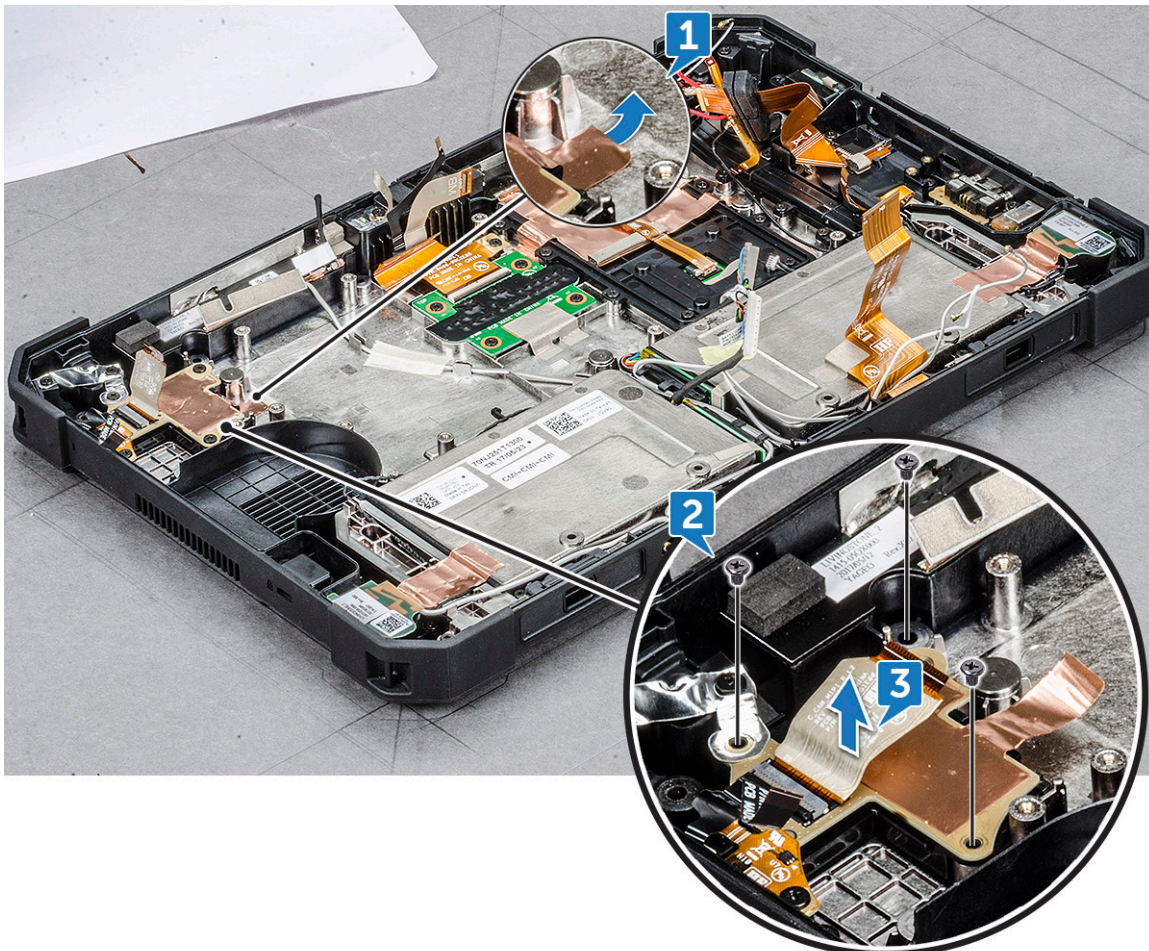
1. Connect the docking board cable to the connector.
 - NOTE:** Slide the cable through the connector clips and release the latch.
2. Align the docking board with the screw holes on the tablet chassis.
3. Replace the screws (4) to secure the back docking board to the tablet chassis.
4. Ensure to replace the adhesive tape to secure the docking board to the system chassis.
 - CAUTION:** Connect the cables to respective slot that were disconnected while removing the docking board. See [removing system board](#).
5. Install the:
 - a. [System board](#)
 - b. [WWAN](#)
 - c. [WLAN](#)
 - d. [System fan](#)
 - e. [Heat sink](#)

- f. Display assembly
 - g. Battery
6. Follow the procedure in [After working inside your computer](#).

Back Camera

Removing back camera

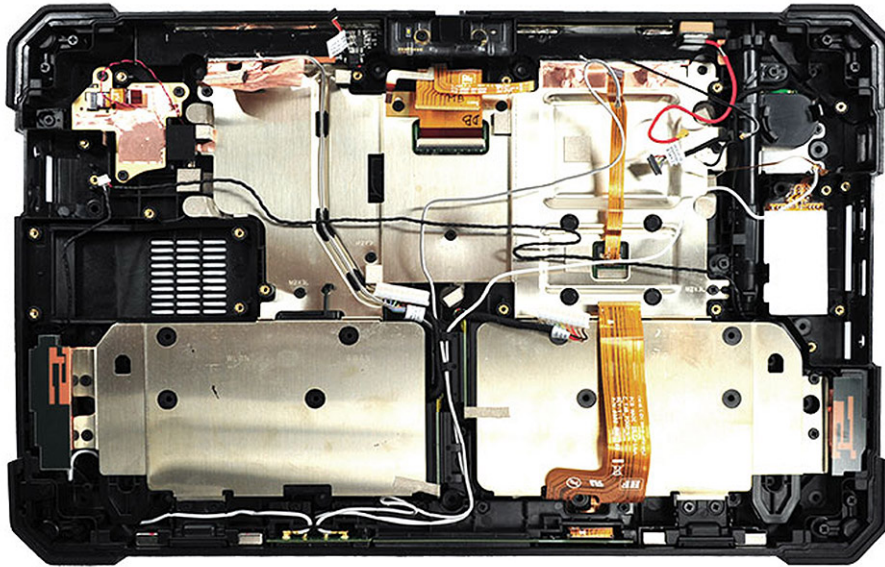
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the:
 - a. Battery
 - b. Display assembly
 - c. Heat sink
 - d. System fan
 - e. WLAN
 - f. WWAN
 - g. System board
3. To remove the back camera:
 - a. Remove the copper adhesive tape that secures the back camera circuit board on the base assembly [1].



- b. Remove the screws (3) that secures the back camera circuit board on the system board chassis [2].

NOTE: Finger print reader cable head is disconnected from the system board.

- c. Lift the latch, and slide to remove the back camera board cable on the system board [3].



Ensure to remove all components, to resolve issues in bottom base assembly when troubleshooting issues are not resolved by replacing the FRU-CRU components.

Installing back camera

1. Connect the back camera cable to the connector.
2. Align the back camera circuit board with the screw holes on the tablet chassis.
3. Replace the screws (3) to secure the back camera circuit board to the tablet chassis.
4. Connect the finger print reader cable on the system board.

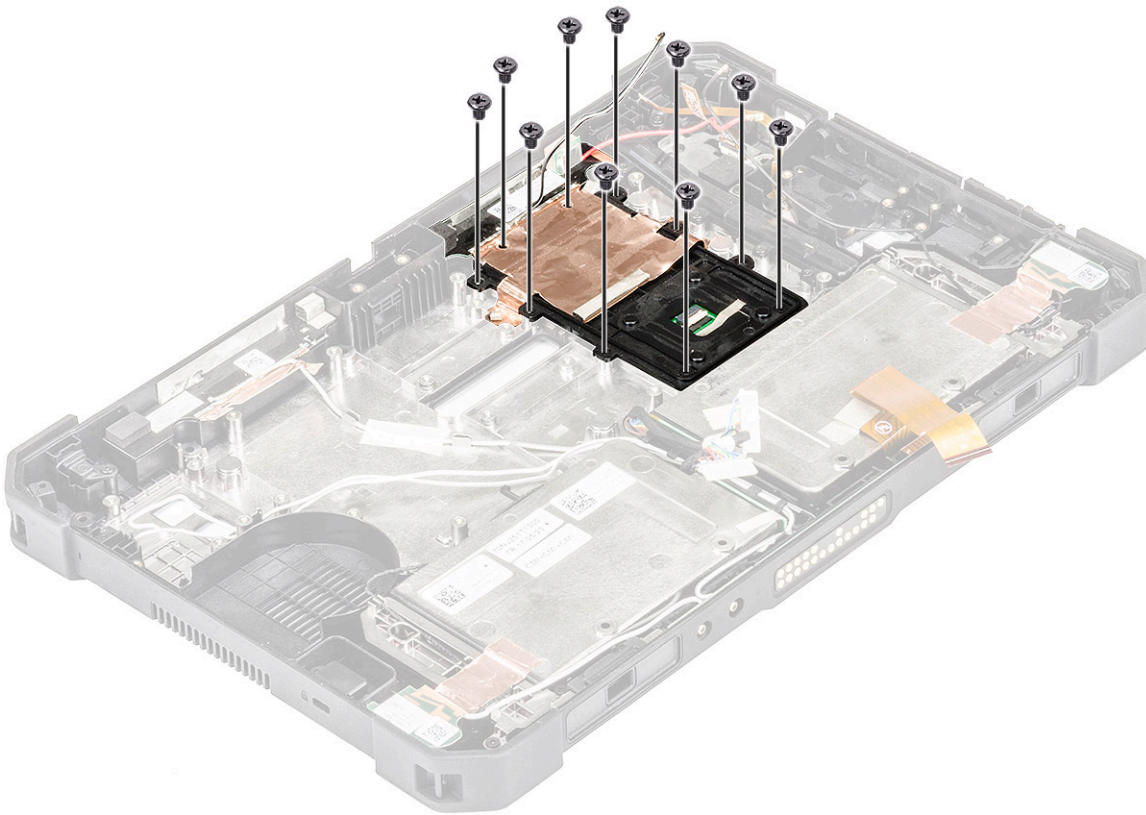
CAUTION: Connect the cables to respective slot that were disconnected while removing the back camera circuit board. See [removing system board](#).

5. Install the:
 - a. [System board](#)
 - b. [WWAN](#)
 - c. [WLAN](#)
 - d. [System fan](#)
 - e. [Heat sink](#)
 - f. [Display assembly](#)
 - g. [Battery](#)
6. Follow the procedure in [After working inside your computer](#).

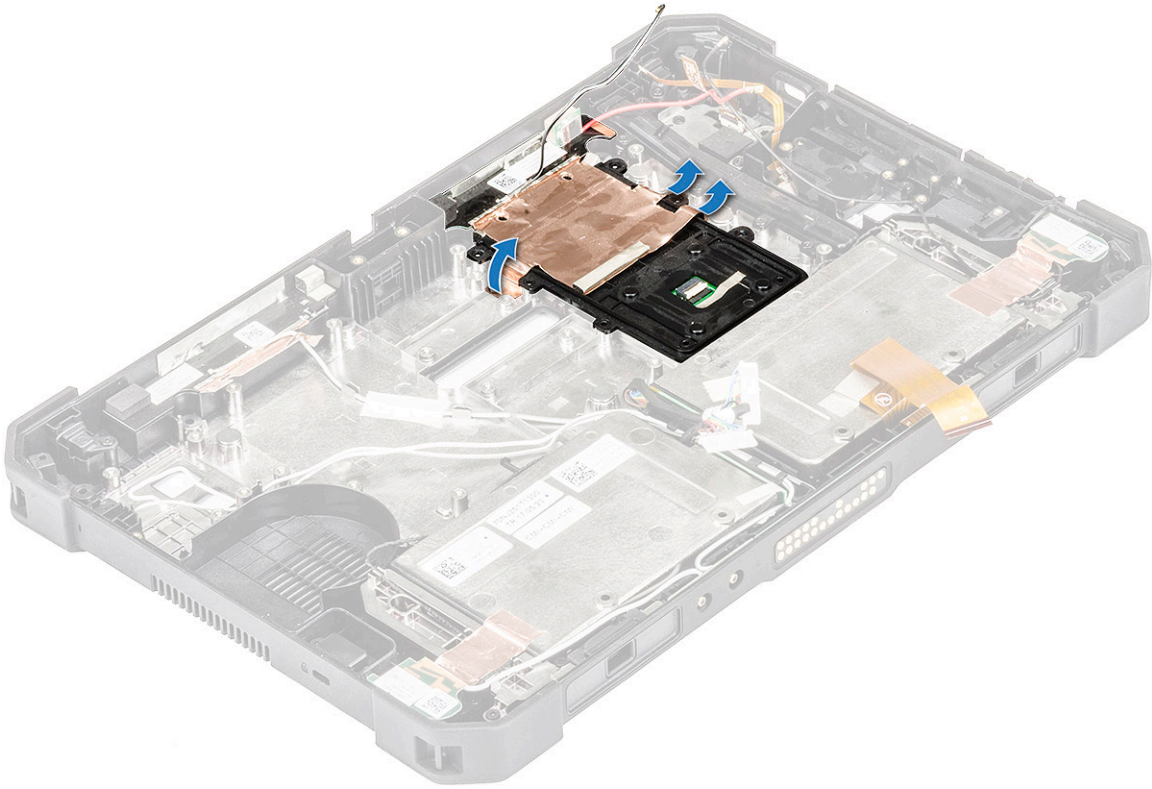
Smartcard holder

Removing smartcard holder

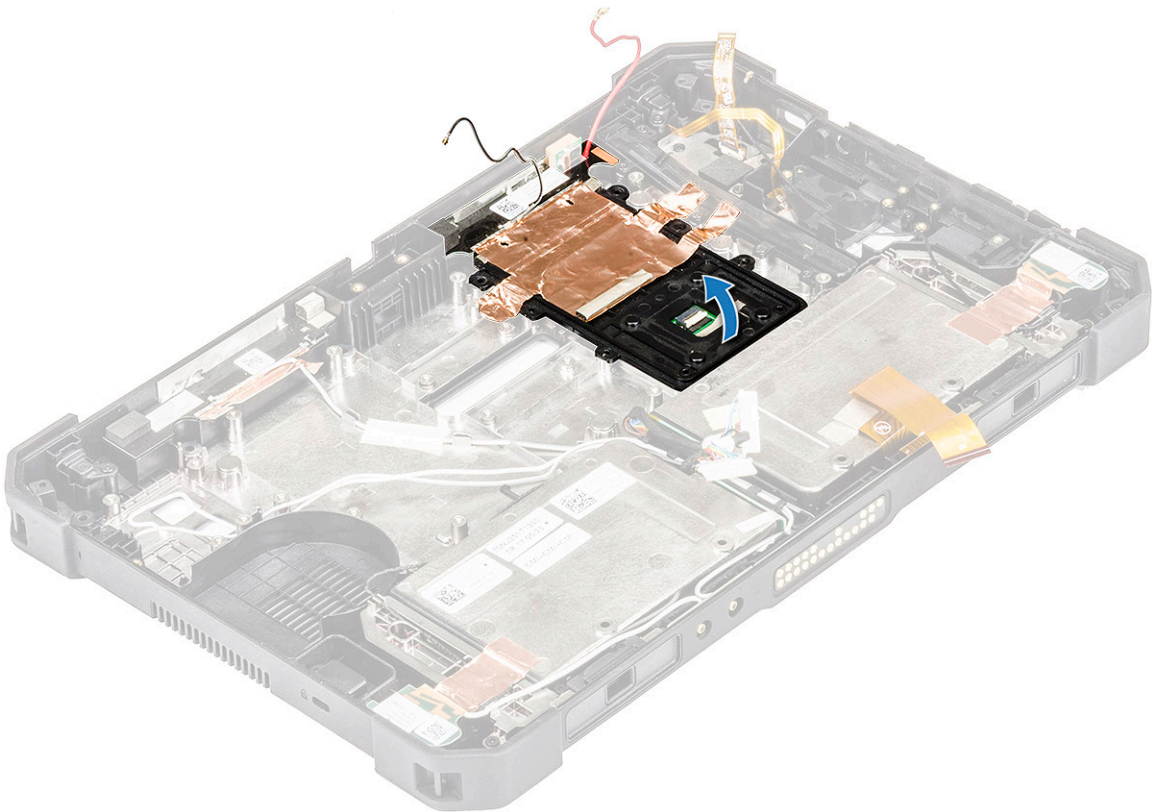
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the:
 - a. [Battery](#)
 - b. [Display assembly](#)
 - c. [System board](#)
3. To remove the smartcard holder:
 - a. Place the back side of system on a flat surface.
 - b. Locate the smartcard holder.
 - c. Remove the screws (10) that secures the smartcard holder to the system board.



4. Remove the copper adhesive shield that secures the smartcard holder.



5. Lift the smartcard from the tablet chassis.



Installing smartcard holder

1. Align the smartcard holder in the tablet chassis.
2. Align and press the copper shield to secure the smart card holder.
3. Replace the screws (10) to secure the smartcard.
4. Install the:
 - a. [Display assembly](#)
 - b. [System board](#)
 - c. [Battery](#)
5. Follow the procedure in [After working inside your computer](#).

Bottom base assembly

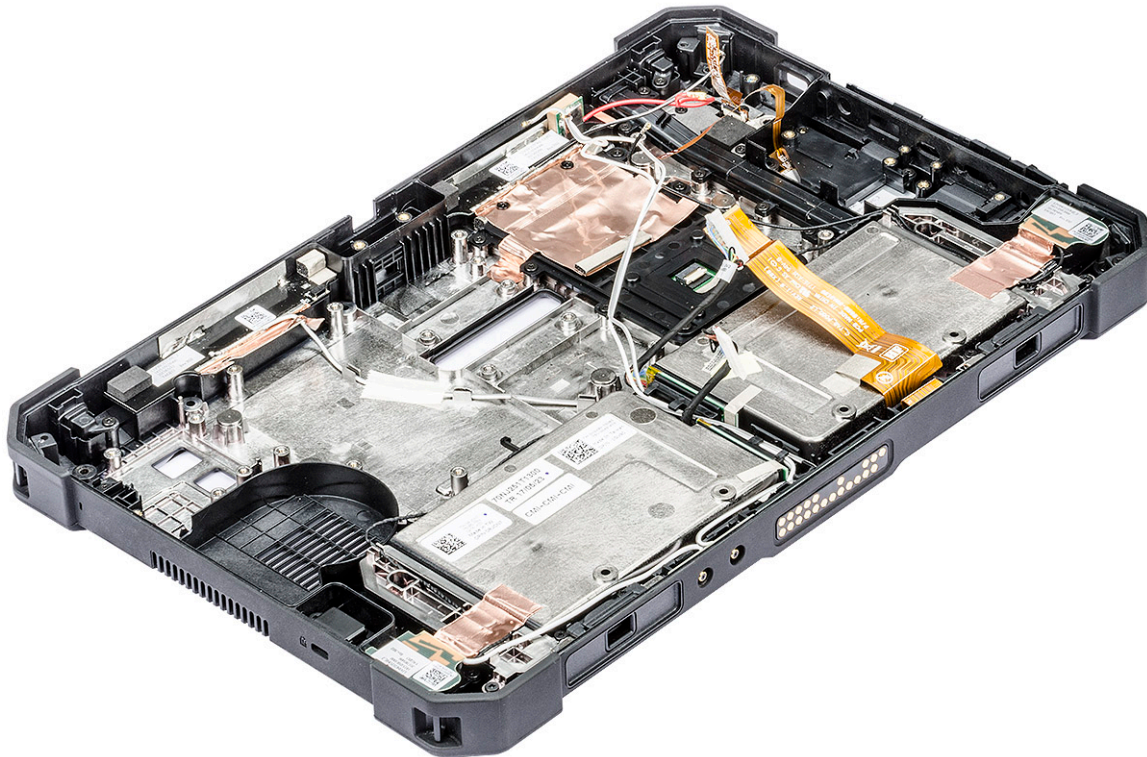
Removing bottom base assembly

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the:
 - a. [Battery](#)
 - b. [Display assembly](#)
 - c. [Heat sink](#)
 - d. [System fan](#)
 - e. [WLAN](#)
 - f. [WWAN](#)
 - g. [System board](#)
 - h. [Back camera](#)
3. To remove the bottom base assembly:
 - a. Remove the following components of the bottom base assembly:



- Antenna Left Ground Plate
- Antenna LTE Aux GPS
- Antenna LTE Main Psensor
- Antenna Main Ground Plate
- Antenna Right Ground Plate
- Antenna WLAN Aux
- Antenna WLAN Main
- Bottom Casing Assembly
- Bumper Brackets
- Conductive Dock
- Conductive Dock FPC Cable
- DC-In Cable
- DC-In Door
- Fingerprint Reader Bracket
- Fingerprint Reader cable
- Fingerprint Sensor Module
- I/O Door (Left and Right)
- Kensington Lock Bracket
- LTE PTH Cable
- Magnets for Docking System
- NFC Antenna
- Passthrough Board
- Power Button Assembly
- Power Button Cable
- SIM Card Door
- Smart Card Daughterboard (include cable)
- Speakers (Left and Right)

- Strapcover (Left and Right)
- Stylus Tube Assembly
- WLAN PTH Cable



CAUTION: Ensure to remove all components cable from the routing clip with a plastic scribe on the system board. to avoid damage to the connected cables.

Installing bottom base assembly

1. Connect the back camera cable to the connector.
2. Align the back camera circuit board with the screw holes on the tablet chassis.
3. Replace the screws (3) to secure the back camera circuit board to the tablet chassis.
4. Connect the finger print reader cable on the system board.

CAUTION: Connect the cables to respective slot that were disconnected while removing the back camera circuit board. See [removing system board](#).

5. Install the:
 - a. [System board](#)
 - b. [WWAN](#)
 - c. [WLAN](#)
 - d. [System fan](#)
 - e. [Heat sink](#)
 - f. [Display assembly](#)
 - g. [Battery](#)
6. Follow the procedure in [After working inside your computer](#).

Technology and components

This chapter details the technology and components available in the system.

Topics:

- [Power adapter](#)
- [USB features](#)
- [Memory features](#)

Power adapter

This laptop is shipped with power adapter.

⚠ WARNING: When you disconnect the power adapter cable from the laptop, grasp the connector, not the cable itself, and then pull firmly but gently to avoid damaging the cable.

⚠ WARNING: The power adapter works with electrical outlets worldwide. However, power connectors and power strips vary among countries. Using an incompatible cable or improperly connecting the cable to the power strip or electrical outlet may cause fire or equipment damage.

USB features

The Universal Serial Bus, or well known as USB was introduced to the PC world in 1996 which dramatically simplified the connection between host computer and peripheral devices such as mice and keyboards, external hard drive or optical devices, Bluetooth and many more peripheral devices in the market.

Let's take a quick look on the USB evolution referencing to the table below.

Table 2. USB evolution

Type	Data Transfer Rate	Category	Introduction Year
USB 3.0/USB 3.1 Gen 1	5 Gbps	Super Speed	2010
USB 2.0	480 Mbps	High Speed	2000

USB 3.0/USB 3.1 Gen 1 (SuperSpeed USB)

For years, the USB 2.0 has been firmly entrenched as the de facto interface standard in the PC world with about 6 billion devices sold, and yet the need for more speed grows by ever faster computing hardware and ever greater bandwidth demands. The USB 3.0/USB 3.1 Gen 1 finally has the answer to the consumers' demands with a theoretically 10 times faster than its predecessor. In a nutshell, USB 3.1 Gen 1 features are as follows:

- Higher transfer rates (up to 5 Gbps)
- Increased maximum bus power and increased device current draw to better accommodate power-hungry devices
- New power management features
- Full-duplex data transfers and support for new transfer types
- Backward USB 2.0 compatibility
- New connectors and cable

The topics below cover some of the most commonly asked questions regarding USB 3.0/USB 3.1 Gen 1.

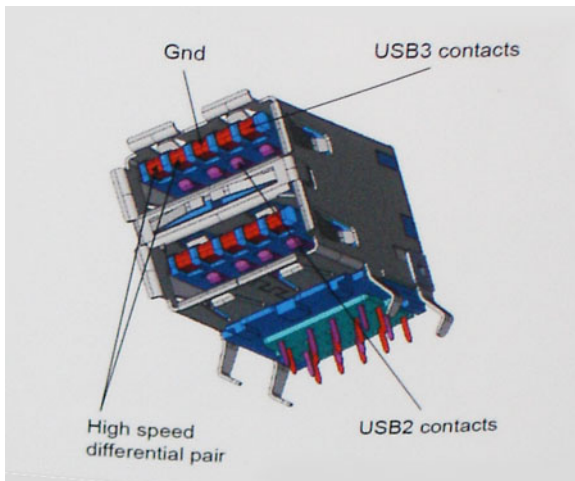


Speed

Currently, there are 3 speed modes defined by the latest USB 3.0/USB 3.1 Gen 1 specification. They are Super-Speed, Hi-Speed and Full-Speed. The new SuperSpeed mode has a transfer rate of 4.8Gbps. While the specification retains Hi-Speed, and Full-Speed USB mode, commonly known as USB 2.0 and 1.1 respectively, the slower modes still operate at 480Mbps and 12Mbps respectively and are kept to maintain backward compatibility.

USB 3.0/USB 3.1 Gen 1 achieves the much higher performance by the technical changes below:

- An additional physical bus that is added in parallel with the existing USB 2.0 bus (refer to the picture below).
- USB 2.0 previously had four wires (power, ground, and a pair for differential data); USB 3.0/USB 3.1 Gen 1 adds four more for two pairs of differential signals (receive and transmit) for a combined total of eight connections in the connectors and cabling.
- USB 3.0/USB 3.1 Gen 1 utilizes the bidirectional data interface, rather than USB 2.0's half-duplex arrangement. This gives a 10-fold increase in theoretical bandwidth.



With today's ever increasing demands placed on data transfers with high-definition video content, terabyte storage devices, high megapixel count digital cameras etc., USB 2.0 may not be fast enough. Furthermore, no USB 2.0 connection could ever come close to the 480Mbps theoretical maximum throughput, making data transfer at around 320Mbps (40MB/s) — the actual real-world maximum. Similarly, USB 3.0/USB 3.1 Gen 1 connections will never achieve 4.8Gbps. We will likely see a real-world maximum rate of 400MB/s with overheads. At this speed, USB 3.0/USB 3.1 Gen 1 is a 10x improvement over USB 2.0.

Applications

USB 3.0/USB 3.1 Gen 1 opens up the laneways and provides more headroom for devices to deliver a better overall experience. Where USB video was barely tolerable previously (both from a maximum resolution, latency, and video compression perspective), it's easy to imagine that with 5-10 times the bandwidth available, USB video solutions should work that much better. Single-link DVI requires almost 2Gbps throughput. Where 480Mbps was limiting, 5Gbps is more than promising. With its promised 4.8Gbps speed, the standard will find its way into some products that previously weren't USB territory, like external RAID storage systems.

Listed below are some of the available SuperSpeed USB 3.0/USB 3.1 Gen 1 products:

- External Desktop USB 3.0/USB 3.1 Gen 1 Hard Drives
- Portable USB 3.0/USB 3.1 Gen 1 Hard Drives
- USB 3.0/USB 3.1 Gen 1 Drive Docks & Adapters
- USB 3.0/USB 3.1 Gen 1 Flash Drives & Readers
- USB 3.0/USB 3.1 Gen 1 Solid-state Drives
- USB 3.0/USB 3.1 Gen 1 RAIDs
- Optical Media Drives

- Multimedia Devices
- Networking
- USB 3.0/USB 3.1 Gen 1 Adapter Cards & Hubs

Compatibility

The good news is that USB 3.0/USB 3.1 Gen 1 has been carefully planned from the start to peacefully co-exist with USB 2.0. First of all, while USB 3.0/USB 3.1 Gen 1 specifies new physical connections and thus new cables to take advantage of the higher speed capability of the new protocol, the connector itself remains the same rectangular shape with the four USB 2.0 contacts in the exact same location as before. Five new connections to carry receive and transmitted data independently are present on USB 3.0/USB 3.1 Gen 1 cables and only come into contact when connected to a proper SuperSpeed USB connection.

Windows 8/10 will be bringing native support for USB 3.1 Gen 1 controllers. This is in contrast to previous versions of Windows, which continue to require separate drivers for USB 3.0/USB 3.1 Gen 1 controllers.

Microsoft announced that Windows 7 would have USB 3.1 Gen 1 support, perhaps not on its immediate release, but in a subsequent Service Pack or update. It is not out of the question to think that following a successful release of USB 3.0/USB 3.1 Gen 1 support in Windows 7, SuperSpeed support would trickle down to Vista. Microsoft has confirmed this by stating that most of their partners share the opinion that Vista should also support USB 3.0/USB 3.1 Gen 1.

Super-Speed support for Windows XP is unknown at this point. Given that XP is a seven-year-old operating system, the likelihood of this happening is remote.

Memory features

This laptop supports a minimum memory of 8GB and a maximum of 16 GB DDR4 memory, up to 1866 MHz

Software

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

Topics:

- [Supported operating systems](#)
- [Downloading drivers](#)
- [Intel audio drivers](#)
- [Intel chipset drivers](#)
- [Intel HD Graphics drivers](#)
- [Network drivers](#)
- [System devices drivers](#)
- [Storage drivers](#)

Supported operating systems


The following list shows supported operating systems

Table 3. Supported operating systems

Supported operating systems	Operating System Description
Microsoft Windows 10	<ul style="list-style-type: none"> • Microsoft Windows 10.x (Professional, Enterprise, and IoT editions)
Other	<ul style="list-style-type: none"> • Microsoft Windows 7 on Skylake Windows 7 Professional 64bit (available through downgrade rights from Windows10 Pro License) (supported only for Intel 6th generation processors)
OS Media Support	<ul style="list-style-type: none"> • Dell.com/support to download eligible Windows OS • USB media available for upsell

Downloading drivers

1. Turn on the laptop.
2. Go to **Dell.com/support**.
3. Click **Product Support**, enter the Service Tag of your laptop, and then click **Submit**.

 **NOTE:** If you do not have the Service Tag, use the auto detect feature or manually browse for your laptop model.

4. Click **Drivers and Downloads**.
5. Select the operating system installed on your laptop.
6. Scroll down the page and select the driver to install.
7. Click **Download File** to download the driver for your laptop.
8. After the download is complete, navigate to the folder where you saved the driver file.
9. Double-click the driver file icon and follow the instructions on the screen.

Intel audio drivers

Verify if the Realtek audio drivers are already installed in the laptop.

Table 4. Intel Audio drivers

Before installation	After installation
<ul style="list-style-type: none"> Sound, video and game controllers <ul style="list-style-type: none"> Intel(R) Display Audio 	<ul style="list-style-type: none"> Software devices Sound, video and game controllers <ul style="list-style-type: none"> Intel(R) Display Audio Realtek Audio Storage controllers

Intel chipset drivers

Verify if the Intel chipset drivers are already installed in the laptop.

Table 5. Intel chipset drivers

Before installation	After installation
<ul style="list-style-type: none"> System devices <ul style="list-style-type: none"> ACPI Fan ACPI Fan ACPI Fan ACPI Fan ACPI Fan ACPI Fixed Feature Button ACPI Lid ACPI Power Button ACPI Processor Aggregator ACPI Sleep Button ACPI Thermal Zone ACPI Thermal Zone ACPI Thermal Zone Composite Bus Enumerator Direct memory access controller High Definition Audio Controller High Definition Audio Controller High precision event timer Intel(R) 82802 Firmware Hub Device Microsoft ACPI-Compliant Embedded Controller Microsoft ACPI-Compliant System Microsoft System Management BIOS Driver Microsoft Virtual Drive Enumerator Microsoft Windows Management Interface for ACPI PCI Express Root Complex PCI Express standard Root Port PCI Express standard Root Port PCI standard host CPU bridge PCI standard ISA bridge Plug and Play Software Device Enumerator Programmable interrupt controller Remote Desktop Device Redirector Bus System CMOS/real time clock System timer UMBus Root Bus Enumerator 	<ul style="list-style-type: none"> Intel(R) Management Engine Interface Intel(R) Power Engine Plug-in Intel(R) Serial IO I2C Host Controller - 9D60 Intel(R) Serial IO I2C Host Controller - 9D61 Intel(R) Serial IO I2C Host Controller - 9D62 Intel(R) Serial IO I2C Host Controller - 9D64 Intel(R) Virtual Buttons Intel(R) Xeon(R) E3 - 1200 v6/7th Gen Intel(R) Core(TM) Host Bridge/DRAM Registers - 5904 ISS Dynamic Bus Enumerator Legacy device Microsoft ACPI-Compliant Embedded Controller Microsoft ACPI-Compliant System Microsoft System Management BIOS Driver Microsoft UEFI-Compliant System Microsoft Virtual Drive Enumerator Microsoft Windows Management Interface for ACPI Mobile 6th/7th Generation Intel(R) Processor Family I/O PCI Express Root Port #12 - 9D1B Mobile 6th/7th Generation Intel(R) Processor Family I/O PCI Express Root Port #4 - 9D13 Mobile 6th/7th Generation Intel(R) Processor Family I/O PMC - 9D21 Mobile 6th/7th Generation Intel(R) Processor Family I/O SMBUS - 9D23 Mobile 6th/7th Generation Intel(R) Processor Family I/O Thermal subsystem - 9D31 Mobile 7th Generation Intel(R) Processor Family I/O LPC Controller (U with iHDPC2.2 Premium) - 9D4E NDIS Virtual Network Adapter Enumerator NFC USB Bus Driver PCI Express Root Complex Plug and Play Software Device Enumerator Programmable interrupt controller Remote Desktop Device Redirector Bus System CMOS/real time clock System timer UMBus Root Bus Enumerator

Intel HD Graphics drivers

Verify if the Intel HD Graphics drivers are already installed in the laptop.

Table 6. Intel HD Graphics drivers

Before installation	After installation
<ul style="list-style-type: none"> Display adapters <ul style="list-style-type: none"> Microsoft Basic Display Adapter 	<ul style="list-style-type: none"> Disk drives Display adapters <ul style="list-style-type: none"> Intel(R) HD Graphics 620 Firmware

Network drivers

Verify if the Network drivers are already installed in the laptop.

Table 7. Network drivers

Before installation	After installation
<ul style="list-style-type: none"> Network adapters <ul style="list-style-type: none"> DW5811e Snapdragon™ X7 LTE WAN Miniport (IKEv2) WAN Miniport (IP) WAN Miniport (IPv6) WAN Miniport (L2TP) WAN Miniport (Network Monitor) WAN Miniport (PPPOE) WAN Miniport (PPTP) WAN Miniport (SSTP) 	<ul style="list-style-type: none"> mice and other pointing devices Monitors Network adapters <ul style="list-style-type: none"> Bluetooth Device (Personal Area Network) Bluetooth Device (RFCOMM Protocol TDI) DW5811e Snapdragon™ X7 LTE Intel(R) Dual Band Wireless-AC 8265 WAN Miniport (IKEv2) WAN Miniport (IP) WAN Miniport (IPv6) WAN Miniport (L2TP) WAN Miniport (Network Monitor) WAN Miniport (PPPOE) WAN Miniport (PPTP) WAN Miniport (SSTP) Ports (COM & LPT)

System devices drivers

Verify if the System devices drivers are already installed in the laptop.

Table 8. System devices drivers

Before installation	After installation
<ul style="list-style-type: none"> System devices <ul style="list-style-type: none"> ACPI Fan ACPI Fan ACPI Fan ACPI Fan ACPI Fan ACPI Fixed Feature Button ACPI Lid ACPI Power Button ACPI Processor Aggregator ACPI Sleep Button ACPI Thermal Zone ACPI Thermal Zone ACPI Thermal Zone Composite Bus Enumerator Direct memory access controller High Definition Audio Controller High Definition Audio Controller High precision event timer Intel(R) 82802 Firmware Hub Device Microsoft ACPI-Compliant Embedded Controller Microsoft ACPI-Compliant System Microsoft System Management BIOS Driver Microsoft Virtual Drive Enumerator Microsoft Windows Management Interface for ACPI PCI Express Root Complex PCI Express standard Root Port PCI Express standard Root Port PCI standard host CPU bridge PCI standard ISA bridge Plug and Play Software Device Enumerator Programmable interrupt controller Remote Desktop Device Redirector Bus System CMOS/real time clock System timer USB Root Bus Enumerator 	<ul style="list-style-type: none"> System devices <ul style="list-style-type: none"> ACPI Fixed Feature Button ACPI Lid ACPI Processor Aggregator ACPI Sleep Button ACPI Thermal Zone Camera Sensor OV5670 Camera Sensor OV8858 Charge Arbitration Driver Composite Bus Enumerator Dell Diag Control Device Dell System Analyzer Control Device High Definition Audio Controller High precision event timer Intel(R) Control Logic Intel(R) CS12 Host Controller Intel(R) Imaging Signal Processor 2500 Intel(R) Integrated Sensor Solution Intel(R) Management Engine Interface Intel(R) Power Engine Plug-in Intel(R) Serial IO I2C Host Controller - 9D60 Intel(R) Serial IO I2C Host Controller - 9D61 Intel(R) Serial IO I2C Host Controller - 9D62 Intel(R) Serial IO I2C Host Controller - 9D64 Intel(R) Virtual Buttons Intel(R) Xeon(R) E3 - 1200 v6/7th Gen Intel(R) Core(TM) Host Bridge/DRAM Registers - 5904 ISS Dynamic Bus Enumerator Legacy device Microsoft ACPI-Compliant Embedded Controller Microsoft ACPI-Compliant System Microsoft System Management BIOS Driver Microsoft UEFI-Compliant System

Storage drivers

Verify if the Storage drivers are already installed in the laptop.

Table 9. Storage drivers

Before installation	After installation
<ul style="list-style-type: none">↳ Storage controllers<ul style="list-style-type: none">↳ Microsoft Storage Spaces Controller	<ul style="list-style-type: none">↳ Memory technology devices<ul style="list-style-type: none">↳ Realtek PCIE CardReader

System specifications

This chapter provides detailed product specifications and the comparison with its predecessors.

NOTE: Offerings may vary by region. The following specifications are only those required by law to ship with your computer. For more information about the configuration of your computer, go to Help and Support in your Windows operating system and select the option to view information about your computer.

Topics:

- [Product overview](#)
- [Power and battery-status light](#)
- [System specifications](#)
- [Processor specifications](#)
- [Memory specifications](#)
- [Storage specifications](#)
- [Audio specifications](#)
- [Video specifications](#)
- [Camera specifications](#)
- [Communication specifications](#)
- [Port and connector specifications](#)
- [Display specifications](#)
- [Touch specifications](#)
- [Adapter specifications](#)
- [Physical dimension specifications](#)
- [Environmental specifications](#)

Product overview

The Latitude 7212 Rugged Extreme Tablet is Dell's ruggedized tablet in the rugged portfolio. Its design is engineered for industrial and outdoor environments where customers need mobile computing power that is durable and able to perform in extreme conditions that expose the system to temperature extremes, high humidity, or pose the risk of damage from water or dust.

Key Features

Some of the key features of the Latitude 7212 Rugged Extreme Tablet include the following:

- Outdoor viewable and capacitive Glovetouch touch screen
- Dual hot-swap battery
- Enhanced 4th-generation quad-cool thermal management that allows the tablet to operate in extreme temperatures
- Designed with Dell Rugged universal pogo-pin docking interface
- Extensive ecosystem accessories

Power and battery-status light

This chapter details the power and status light of the tablet.

Indicates the power state and battery state of the computer.

- Solid green—Power adapter is connected and the battery is charging.
- Solid amber—Battery charge is low or critical.
- Off—Battery is fully charged.

System specifications

Feature	Specification
Chipset	Intel Core i3/i5/i7 series
DRAM bus width	128 bit (64-bits x 2 channels)
Flash EPROM	Quad SPI 128 Mbit
PCIe bus	100 MHz
External Bus Frequency	PCIe Gen3 (8 GT/s)

Processor specifications

Feature	Specification
Types	<ul style="list-style-type: none">7th Generation Intel Core U i3, i5 and i7 dual core processor6th Generation Intel Core i5 dual-core processor
L3 cache - i3	3 MB
L3 cache - i5	4 MB
L3 cache - i7	4 MB

Memory specifications

Feature	Specification
Memory type	LPDDR3
Speed	1866 MHz
Minimum memory	8 GB
Maximum memory	16 GB

Storage specifications


Feature	Specification
SDD M.2 NVMe	256 GB to 1 TB
SSD M.2 SATA	128 GB to 1 TB

Audio specifications

Feature	Specification
Types	High-definition audio
Controller	Integrated ALC3235
Stereo conversion	Digital audio-out through HDMI — up to 24 bit compressed and uncompressed audio

Feature	Specification
Internal interface	High-definition audio codec
External interface	Stereo headset/mic combo
Speakers	Two stereo speakers
Internal speaker amplifier	2 W per channel
Volume controls	Volume buttons

Video specifications

Feature	Specification
Type	Integrated on system board, hardware accelerated
UMA controller	iGPU GT2 graphics
Data bus	Integrated video
External display support	<ul style="list-style-type: none"> On system – eDP (internal display) Optional Type-C port – VGA, DisplayPort 1.2, DVI <p> NOTE: Supports one VGA, DisplayPort, HDMI through the Docking station.</p>

Camera specifications

Feature	Specification
Type	<ul style="list-style-type: none"> Front Camera - 5 MP fixed focus Rear Camera - 8 MP auto focus
Sensor type	CMOS sensor technology (Front and Rear camera)
Imaging rate	Up to 30 frames per second
Video Resolution	<ul style="list-style-type: none"> Front Camera - 2592 pixels x 1944 pixels for MIPI Front Camera - 1920 pixels x 1080 pixels for USB Rear Camera - 3264 pixels x 2448 pixels for MIPI Rear Camera - 3280 Pixels x 2464 pixels for USB

Communication specifications

Feature	Specification
Network adapter	<ul style="list-style-type: none"> USB 3.1 Gen1 and USB Type-C
Wireless	<ul style="list-style-type: none"> Intel Dual Band Wireless-AC 8265 with Bluetooth 4.2 + vPro Mobile broadband Qualcomm QCA61x4A 802.11ac Dual Band (2x2) Wireless Adapter + Bluetooth 4.1 WWAN NFC LTE Micro SIM slot

Port and connector specifications

Feature	Specification
Audio	Universal audio jack (headset/input) 1x 3.5 mm jack
Video	One mini HDMI connector (Supported through Type-C output)
Network adapter	<ul style="list-style-type: none">• USB 3.1 & USB Type-C
Serial port	1x micro serial connector
Docking port	<ul style="list-style-type: none">• One Docking Port• One Dual (WLAN/WWAN) RF passthrough
USB ports	<ul style="list-style-type: none">• One USB 3.1 Gen 1 port with PowerShare• One displayPort with PowerShare over USB Type-C
Memory card reader	One microSD card reader
SIM card slot	One micro-SIM slot with security feature
Modular Expansion	One Pogo pin modular expansion port

Display specifications

Feature	Specification
Type	WLED display, FHD
Size	11.6 inches
Height	158.5 mm (6.24 in.)
Width	268.0 mm (10.59 in.)
Active area (X/Y)	256.12 mm x 144 mm
Maximum resolution	1920 x 1080 pixels
Refresh rate	60 Hz
Operating angle	0° (closed) to 180°
Minimum viewing angles (horizontal)	<ul style="list-style-type: none">• 89 TYP
Minimum viewing angles (vertical)	<ul style="list-style-type: none">• 89 TYP
Pixel pitch	0.1335 mm

Touch specifications

Feature	Specification
Sample report Rate	>= 100 Hz per finger/pen
Response Latency	<15ms for all touch points
Touch accuracy	<ul style="list-style-type: none">• +/- 1.0mm from center


Feature	Specification
	<ul style="list-style-type: none"> • +/- 1.0mm from edge
Finger pitch Separation	<=8mm (center to center)
Active power draw	< 100 mW)
Idle Power draw	< 5mW
Maximum resolution	1366 x 768 pixels
Power states (mobile only)	Active, Idle and Sleep

Adapter specifications

Feature	Specification
Type	<ul style="list-style-type: none"> • 45W • 65 W • 90 W • Type-C adapter
Input voltage	100 V AC – 240 V AC
Input current (maximum)	0.60 A / 1.7 A
Input frequency	50 Hz to 60 Hz
Output current	2.31/ 3.34
Rated output voltage	19.5 V DC
Connector	4.5 mm barrel
Temperature range (operating)	0°C to 40°C (32°F to 104°F)
Temperature range (nonoperating)	-40°C to 70°C (-40°F to 158°F)

Physical dimension specifications

Feature	Specification
Height	Typical: 203.00 mm (7.99 inches)
	Maximum: 209.00 mm (8.23 inches)
Width	Typical: 312.20 mm (12.29 inches)
	Maximum: 318.20 mm (12.53 inches)
Thickness	Typical: 24.40 mm (0.96 inches)
	Maximum: 28.90 mm (1.14 inches)

Feature	Specification
Weight	Maximum: 1.27 kg (2.82 lbs)  NOTE: The weight of the tablet will vary depending on the configuration ordered and the manufacturing variability.

Environmental specifications

Feature	Specifications
Temperature — operating	-29°C to 63°C (20°F to 145°F)
Temperature — storage	-51°C to 71°C (-60°F to 160°F)
Relative humidity (maximum) — operating	10% to 90% (non-condensing)
Relative humidity (maximum) — storage	5% to 95% (non-condensing)
Altitude (maximum) — operating	-16 m to 12192 m (-50 ft to 40000 ft)
Altitude (maximum) — nonoperating	-15.20 m to 12192 m (-50 ft to 40,000 ft)
Airborne contaminant level	G1 as defined by ISA-71.04-1985

System setup

System setup enables you to manage your hardware and specify BIOS level options. From the System setup, you can:

- Change the NVRAM settings after you add or remove hardware
- View the system hardware configuration
- Enable or disable integrated devices
- Set performance and power management thresholds
- Manage your computer security

Topics:

- [Boot Sequence](#)
- [Navigation keys](#)
- [System Setup overview](#)

Boot Sequence

Boot Sequence allows 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:** XXX denotes the SATA drive number.
- Optical Drive (if available)
- SATA Hard Drive (if available)
- Diagnostics
 - **NOTE:** Choosing **Diagnostics**, will display the **ePSA diagnostics** screen.

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

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. <ul style="list-style-type: none"> • NOTE: For the standard graphics browser only.
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.

System Setup overview

System Setup allows you to:


- Change the system configuration information after you add, change, or remove any hardware in your computer.
- Set or change a user-selectable option such as the user password.
- Read the current amount of memory or set the type of hard drive installed.

Before you use System Setup, it is recommended that you write down the System Setup screen information for future reference.


 **CAUTION:** Unless you are an expert computer user, do not change the settings for this program. Certain changes can cause your computer to work incorrectly.

General screen options

This section lists the primary hardware features of your computer.

Option	Description
System Information	<ul style="list-style-type: none">• System Information: Displays BIOS Version, Service Tag, Asset Tag, Ownership Tag, Ownership Date, Manufacture Date, and the Express Service Code.• Memory Information: Displays Memory Installed, Memory Available, Memory Speed, Memory Channels Mode, Memory Technology, DIMM A Size, DIMM B Size.• Processor Information: Displays Processor Type, Core Count, Processor ID, Current Clock Speed, Minimum Clock Speed, Maximum Clock Speed, Processor L2 Cache, Processor L3 Cache, HT Capable, and 64-Bit technology.• Device Information: Displays Primary Hard Drive, MiniCard Device, ODD Device, Dock eSATA Device, LOM MAC Address, Video Controller, Video BIOS Version, Video Memory, Panel Type, Native Resolution, Audio Controller, Wi-Fi Device, WiGig Device, Cellular Device, Bluetooth Device.
Battery Information	Displays the battery status and the type of AC adapter connected to the computer.
Boot Sequence	<p>Boot Sequence Allows you to change the order in which the computer attempts to find an operating system. The options are:</p> <ul style="list-style-type: none">• Windows Boot Manager <p>By default, the options is checked.</p> <p>Boot List Options Allows you to change the boot list option:</p> <ul style="list-style-type: none">• Legacy• UEFI (The option is enabled by default)
Advanced Boot Options	Allows you the legacy option ROMs to load. By default, all the option are disabled. <ul style="list-style-type: none">• Enable Legacy Option ROMs• Enable UEFI Network Stack• Enable Attempt Legacy Boot
UEFI Boot Path Security Options	Allows you to control whether or not the system will prompt to the user to enter the Admin password, when a user selects a UEFI boot path from the F12 boot Menu. <ul style="list-style-type: none">• Always, Except Internal HDD. This option is enabled by default.• Always• Never <p> NOTE: These options have no relevance if the Admin password is not set BIOS settings.</p>
Date/Time	Allows you to change the date and time.


System Configuration screen options

Option	Description
SATA Operation	<p>You can configure the internal SATA hard drive controller. The options are:</p> <ul style="list-style-type: none">• Disabled• AHCI• RAID On. This option is enabled by default.
SMART Reporting	<p>You can control whether hard drive errors for integrated drives are reported during system startup. This technology is part of the SMART (Self-Monitoring Analysis and Reporting Technology) specification.</p> <ul style="list-style-type: none">• Enable SMART Reporting
USB Configuration	<p>You can configure the integrated USB controller. If Boot Support is enabled, the system is allowed to boot any type of USB Mass Storage Devices (hard drive or memory key).</p> <p>If the USB port is enabled, the device attached to this port is enabled and available for the OS.</p> <p>If the USB port is disabled, the OS cannot see any device attached to this port.</p> <p>The options are:</p> <ul style="list-style-type: none">• Enable USB Boot Support This option is enabled by default.• Enable External USB Ports This option is enabled by default. <p> NOTE: The USB keyboard and mouse always work in the BIOS setup irrespective of these settings.</p>
USB PowerShare	<p>You can configure the USB PowerShare feature behavior. This option allows you to charge external devices using the stored system battery power through the USB PowerShare port.</p> <ul style="list-style-type: none">• Enable USB PowerShare This option is disabled by default.
Audio	<p>You can enable or disable the integrated audio controller.</p> <p>The Enable Audio option is selected by default.</p>
Keyboard Illumination	<p>You can choose the operating mode of the keyboard illumination feature. The keyboard brightness level can be set from 25 % to 100%. The options are:</p> <ul style="list-style-type: none">• Disabled• Level is 75%• Level is 25%• Level is 100%. This option is enabled by default.• Level is 50%
Tablet Button Illumination	<p>You can control the LED brightness mode of the tablet buttons. The LED brightness level can be set from 25 % to 100%. The options are:</p> <ul style="list-style-type: none">• Off• 75%• 25%• 100%. This option is enabled by default.• 50%
Keyboard Backlight Timeout on AC	<p>The Keyboard Backlight timeout with AC option does not affect the main keyboard illumination feature. The keyboard backlight value is only in effect when the backlight is enabled. Keyboard Illumination continues to support the various illumination levels. The options are:</p> <ul style="list-style-type: none">• 5 seconds• 10 seconds. This option is selected by default.• 15 seconds• 30 seconds• 1 minute• 5 minute• 15 minute• Never
Keyboard Backlight	<p>The Keyboard Backlight with Battery option does not affect the main keyboard illumination feature. Keyboard Illumination continues to support the various illumination levels. The options are:</p>




Option	Description
Timeout on Battery	<ul style="list-style-type: none"> • 5 seconds • 10 seconds. This option is selected by default. • 15 seconds • 30 seconds • 1 minute • 5 minute • 15 minute • Never
RGB Keyboard Backlight	You can configure the RGB keyboard backlight feature. There are six available colors: four preset colors (white, red, green, and blue) and two user configurable colors. The four preset colors White, Red, Green, and Blue is enabled by default, and only the preset color White is active by default.
Touchscreen	You can enable or disable the touchscreen. This option is enabled by default.
Stealth Mode Control	You can enable or disable the stealth mode. This option is enabled by default.
Miscellaneous Devices	You can configure the various devices of the tablet. The options are: <ul style="list-style-type: none"> • Enable User-Facing Camera. This option is enabled by default. • Enable World-Facing Camera. This option is enabled by default. • Enable Dedicated GPS Radio. This option is enabled by default. • Enable Secure Digital (SD) Card. This option is enabled by default. • Secure Digital (SD) Card Boot • Secure Digital (SD) Card Read-Only Mode






Video screen options

Option	Description
LCD Brightness	Allows you to set the display brightness depending up on the power source (On Battery and On AC).

 **NOTE:** The video setting will be visible only when a video card is installed into the system.


Security screen options

Option	Description
Admin Password	<p>Allows you to set, change, or delete the administrator (admin) password.</p> <p> NOTE: You must set the admin password before you set the system or hard drive password. Deleting the admin password automatically deletes the system password and the hard drive password.</p> <p> NOTE: Password changes take effect immediately.</p> <p>By default, the drive will not have a password set.</p>
System Password	<p>Allows you to set, change or delete the system password.</p> <p> NOTE: Password changes take effect immediately.</p> <p>By default, the drive will not have a password set.</p>
Strong Password	<p>Allows you to enforce the option to always set strong passwords.</p> <p>Default Setting: Enable Strong Password is not selected.</p>

Option	Description
	<p> NOTE: If user interface is enabled, Admin and System passwords must contain at least one uppercase character, one lowercase character and be at least 8 characters long.</p>
Password Configuration	Allows you to determine the minimum and maximum length of Administrator and System passwords.
Password Bypass	<p>Allows you to disable or enable the permission to bypass the System and the Internal hard drive password, when they are set. The options are:</p> <ul style="list-style-type: none"> ● Disabled. This option is selected by default. ● Reboot bypass
Password Change	<p>Allows you to enable or disable permission to the System and Hard Drive passwords when the admin password is set.</p> <p>Allow Non-Admin Password Changes This option is selected by default.</p>
Non-Admin Setup Changes	Allows you to determine whether changes to the setup options are allowed when an administrator password is set. If disabled the setup options are locked by the admin password.
UEFI Capsule Firmware Updates	<p>This option controls whether the system allows BIOS updates via UEFI capsule update packages.</p> <p>Enable UEFI Capsule Firmware Updates option is selected by default.</p> <p> NOTE: Disabling this option will block BIOS updates from services such as Microsoft Windows Update and Linux Vendor Firmware Service (LVFS).</p>
TPM 2.0 Security	<p>Allows you to enable the Trusted Platform Module (TPM) during POST.</p> <p>You can control whether the trusted platform module is visible to the operating system. The option is:</p> <ul style="list-style-type: none"> ● TPM on This option is selected by default. ● Clear ● PPI Bypass for Enable Commands This option is selected by default. ● Attestation Enable. This option is selected by default. ● PPI Bypass for Disable Commands ● Key Storage Enable. This option is selected by default. ● SHA-256. This option is selected by default. <p> CAUTION: For the TPM upgrade/downgrade process, it is recommended to complete the process in an AC power with AC adapter plugged into the computer. The upgrade/downgrade process without the AC adapter plugged in might damage the computer or hard disk.</p> <p> NOTE: Disabling this option does not change any settings you have made to the TPM, nor does it delete or change any information or keys you may have stored in the TPM. Changes to this setting take effect immediately.</p>
Computrace (R)	<p>Allows you to activate or disable the optional Computrace Service from Absolute software. The options are:</p> <ul style="list-style-type: none"> ● Deactivate ● Disable ● Activate <p> NOTE: The Activate and Disable options will permanently activate or disable the feature and no further changes will be allowed</p> <p>Default setting: Activate</p>
OROM Keyboard Access	<p>Allows you to set an option to enter the Option ROM Configuration screens using hotkeys during boot. The options are:</p> <ul style="list-style-type: none"> ● Enabled. This option is selected by default. ● One Time Enable ● Disabled <p>Default setting: Enable</p>

Option	Description
Admin Setup Lockout	Allows you to prevent users from entering the setup when an Administrator password is set. Enable Admin Setup Lockout This option is not selected by default.
Master Password Lockout	Allows you to prevent users from entering the setup when an Master password is set. Hard disk passwords need to be cleared before the setting can be changed. Enable Master Password Lockout This option is not selected by default.

Secure Boot

Option	Description
Secure Boot Enable	This option enables or disables the Secure Boot feature. <ul style="list-style-type: none"> • Disabled • Enabled Default setting: Enabled.
Expert Key Management	Allows you to manipulate the security key databases only if the system is in Custom Mode. The Enable Custom Mode option is disabled by default.
Custom Mode Key Management	Allows you to manage the security key databases only if the system is in Custom Mode .The options are: <ul style="list-style-type: none"> • PK. This option is selected by default. • KEK • db • dbx <p> NOTE: If you disable the Enable Custom Mode, all the changes made will be erased and the keys will restore to default settings. Save to File will save the key to a user-selected file.</p>

Intel software Guard Extensions


Option	Description
Intel SGX Enable	This option enables or disables to provide a secured environment for running code/storing sensitive information in the context of the main OS. The options are: <ul style="list-style-type: none"> • Disabled • Enabled • Software Controlled.This option is selected by default.
Enclave Memory Size	Allows you to reserve the memory size. The memory size can be set from 32 MB to 128 MB, these options are disabled by default. The options are: <ul style="list-style-type: none"> • 32 MB • 64 MB • 128 MB




Performance screen options

Option	Description
Multi Core Support	This field specifies whether the process has one or all cores enabled. The performance of some applications improves with the additional cores. This option is enabled by default. Allows you to enable or disable multi-core support for the processor. <ul style="list-style-type: none"> • Enable Multi Core Support Default setting: The option is enabled.
Intel SpeedStep	Allows you to enable or disable the Intel SpeedStep mode of the processor.


Option	Description
	<ul style="list-style-type: none"> • Enable Intel SpeedStep <p>Default setting: The option is enabled.</p>
C-States Control	<p>Allows you to enable or disable the additional processor sleep states.</p> <ul style="list-style-type: none"> • C states <p>Default setting: The option is enabled.</p>
Intel TurboBoost	<p>Allows you to enable or disable the Intel TurboBoost mode of the processor.</p> <ul style="list-style-type: none"> • Enable Intel TurboBoost <p>Default setting: The option is enabled.</p>
HyperThread Control	<p>Allows you to enable or disable the HyperThreading in the processor.</p> <ul style="list-style-type: none"> • Disabled • Enabled <p>Default setting: Enabled.</p>

Power Management

Option	Description
Lid Switch	<p>You can enable or disable the lid switch so the screen does not shut off when the lid is closed. The option is:</p> <ul style="list-style-type: none"> • Enable Lid Switch This option is selected by default.
AC Behavior	<p>You can enable or disable the computer from turning on automatically when an AC adapter is connected. The option is:</p> <ul style="list-style-type: none"> • Wake on AC This option is disabled by default.
Auto On Time	<p>You can set the time at which the computer must turn on automatically. The options are:</p> <ul style="list-style-type: none"> • Disabled. This option is selected by default. • Every Day • Weekdays • Select Days
USB Wake Support	<p>You can enable USB devices to wake the system from Standby.</p> <p> NOTE: This feature is only functional when the AC power adapter is connected. If the AC power adapter is removed during Standby, the system setup removes power from all the USB ports to conserve battery power.</p> <p>The option is:</p> <ul style="list-style-type: none"> • Enable USB Wake Support This option is disabled by default.
Wake on LAN/WLAN	<p>You can enable or disable the feature that turns on the computer from the Off state:</p> <ul style="list-style-type: none"> • When triggered by a LAN signal • From the hibernate state when triggered by a special wireless LAN signal <p>The options are:</p> <ul style="list-style-type: none"> • Disabled. This option is selected by default. • LAN Only • WLAN Only • LAN or WLAN
Peak Shift	<p>You can minimize the AC power consumption during the peak power times of day. After you enable this option, your system runs only in battery even if the AC is attached. The option is:</p> <ul style="list-style-type: none"> • Enable Peak Shift This option is disabled by default.
Advanced Battery Charge Configuration	<p>You can maximize the battery health. By enabling this option, your system uses the standard charging algorithm and other techniques, during the non-work hours to improve the battery health. The option is:</p>

Option	Description
	<ul style="list-style-type: none"> • Enable Advance Battery Charge Mode This option is disabled by default.
Battery#1 Charge Configuration	<p>You can select the charging mode for the battery. The options are:</p> <ul style="list-style-type: none"> • Adaptive. This option is enabled by default. • Standard — Fully charges your battery at a standard rate. • ExpressCharge — The battery charges over a shorter period of time using Dell's fast charging technology. • Primarily AC use Extends the battery lifespan for users who operates their system plugged in to the external power source. • Custom <p>If Custom charge is selected, you can also configure Custom Charge Start and Custom Charge Stop.</p> <p> NOTE: All charging mode may not be available for all the batteries. To enable this option, disable the Advanced Battery Charge Configuration option.</p>
Battery#2 Charge Configuration	<p>You can select the charging mode for the battery. The options are:</p> <ul style="list-style-type: none"> • Adaptive. This option is enabled by default. • Standard — Fully charges your battery at a standard rate. • ExpressCharge — The battery charges over a shorter period of time using Dell's fast charging technology. • Primarily AC use Extends the battery lifespan for users who operates their system plugged in to the external power source. • Custom <p>If Custom charge is selected, you can also configure Custom Charge Start and Custom Charge Stop.</p> <p> NOTE: All charging mode may not be available for all the batteries. To enable this option, disable the Advanced Battery Charge Configuration option.</p>
Dock Battery Charger Mode	<p>You can choose the charging mode for the battery. The option is:</p> <ul style="list-style-type: none"> • Standard This option is enabled by default. • ExpressCharge
Type-C Connector Power	<p>You can set the maximum power that can be drawn from the Type-C connector. The option is:</p> <ul style="list-style-type: none"> • 7.5 Watts This option is enabled by default. • 15 Watts <p> NOTE: If a higher power value is set for the Type-C connector, it may cause the system to throttle.</p>

POST Behavior

Option	Description
Adapter Warnings	<p>Allows you to enable or disable the system setup (BIOS) warning messages when you use certain power adapters.</p> <p>Enable Adapter Warnings This option is selected by default.</p>
Keypad (Embedded)	<p>Allows you to choose one of two methods to enable the keypad that is embedded in the internal keyboard.</p> <ul style="list-style-type: none"> • Fn Key Only This option is enabled by default. • By Numlock <p> NOTE: When setup is running, this option has no effect. Setup works in Fn Key Only mode.</p>
Fn Lock Options	<p>Allows you to let hot key combinations Fn + Esc toggle the primary behavior of F1–F12, between their standard and secondary functions. If you disable this option, you cannot toggle dynamically the primary behavior of these keys. The available options are:</p> <ul style="list-style-type: none"> • Fn Lock This option is enabled by default. • Lock Mode Disable/Standard This option is selected by default. • Lock Mode Enable/Secondary
Fastboot	<p>Allows you to speed up the boot process by bypassing some of the compatibility steps. The options are:</p>

Option	Description
	<ul style="list-style-type: none"> • Minimal This option is selected by default. • Thorough • Auto
Extended BIOS POST Time	<p>Allows you to create an additional pre-boot delay. The options are:</p> <ul style="list-style-type: none"> • 0 seconds This option is enabled by default. • 5 seconds • 10 seconds
Full Screen Logo	<p>Allows you display full screen logo if your image match screen resolution. The options are:</p> <ul style="list-style-type: none"> • Enable Full Screen Logo This option is disabled by default.
Sign of Life Indication	<p>Allows you to illuminate the front panel tablet buttons (Rotation Lock, Volume Down, Volume Up, Windows, P1,P2, and P3) momentarily, when the power button is pressed to turn on the system. The options are:</p> <ul style="list-style-type: none"> • Enable Tablet Button LED Sign of Life This option is selected by default.
Warnings and Errors	<p>Allows you to select in the BIOS setup options that cause the boot process to pause only, when warnings or errors are detected rather than stop, prompt and wait for user input. The options are:</p> <p>Prompt on Warnings and Errors. This option is enabled by default.</p> <p>Continue on Warnings</p> <p>Continue on Warnings and Errors</p>
MAC Address Pass-Through	<p>Allows you to replace the external NIC MAC address in a supported dock or dongle with the selected MAC address from the system. The options are:</p> <p>System Unique MAC Address. This option is enabled by default.</p> <p>Integrated NIC1 MAC Address</p> <p>Disabled</p>


Manageability

Option	Description
USB Provision	<p>Allows you to enable or disable provisioning the Intel AMT from a USB storage device.</p> <p>Enable USB Provision This option is not selected by default.</p>
MEBx Hotkey	<p>Allows you to specify whether the MEBx Hotkey function should be enabled, during the system boot.</p> <p>Enable MEBx Hotkey. This option is selected by default.</p>

Virtualization Support options

Option	Description
Virtualization	<p>Allows you to enable or disable the Intel Virtualization Technology.</p> <p>Enable Intel Virtualization Technology This option is selected by default.</p>
VT for Direct I/O	<p>Enables or disables the Virtual Machine Monitor (VMM) from utilizing the additional hardware capabilities provided by Intel® Virtualization technology for direct I/O.</p> <p>Enable VT for Direct I/O This option is selected by default.</p>
Trusted Execution	<p>This option specifies whether a Measured Virtual Machine Monitor (MVMM) can utilize the additional hardware capabilities provided by Intel Trusted Execution Technology. The TPM Virtualization Technology, and Virtualization technology for direct I/O must be enabled to use this feature.</p> <p>Trusted Execution This option is disabled by default.</p>

Wireless options

Option	Description
VT for Direct I/O	Allows you to enable or disable the wireless devices. The options are: <ul style="list-style-type: none">• WWAN/GPS• WLAN/WiGig• Bluetooth <p> NOTE: These options are enabled by default.</p>

Maintenance

Option	Description
Service Tag	Displays the Service Tag of your computer.
Asset Tag	Allows you to create a system asset tag if an asset tag is not already set. This option is not set by default.
BIOS Downgrade	Allows you to control flashing of the system firmware to previous revisions. The option are: Allows BIOS Downgrade This option is enabled by default.
Data Wipe	Allows you to securely erase data from all internal storage devices. The process adheres to Serial ATA Security Erase and eMMC JEDEC Sanitize specifications. The option are: Wipe on Next Boot This option is disabled by default.
BIOS Recovery	Allows you to recover from certain computed BIOS conditions from a recovery file on the user primary hard drive or an external USB key. When 'Enabled' is selected BIOS stores the recovery file on the user primary hard drive. The option are: BIOS Recovery from Hard Drive This option is enabled by default. BIOS Auto-Recovery Always Perform Integrity Check

System Log

Option	Description
BIOS Events	Allows you to view and clear the System Setup (BIOS) POST events.
Thermal Events	Allows you to view and clear the System Setup (Thermal) events.
Power Events	Allows you to view and clear the System Setup (Power) events.

Support Assist System Resolution

Option	Description
Auto OS Recovery Threshold	Allows you to control the automatic boot flow for Support Assist System Resolution Console and for OS Recovery Tool. The options are: <ul style="list-style-type: none">• OFF• 1• 2 This option is enabled by default.• 3
SupportAssist OS Recovery	Allows you to enable or disable the boot flow for SupportAssist OS Recovery tool in the event of certain system errors. The options is:

Option**Description**

- **SupportAssist OS Recovery** This option is enabled by default.

Troubleshooting

Topics:

- Dell Enhanced Pre-Boot System Assessment - ePSA diagnostic 3.0
- Diagnostic LED
- General Troubleshooting

Dell Enhanced Pre-Boot System Assessment - ePSA diagnostic 3.0

You can invoke the BIOS and ePSA diagnostics by either:

i **NOTE:** As the rugged tablet is without keyboard, perform the following ePSA diagnostic.

- To enter BIOS (system setup) without keyboard, **Power** on system. Press on **Volume decrease** button during startup (as the Dell Logo appears) until the BIOS (system setup) screen is displayed.
- To enter ePSA (system setup) without keyboard, **Power** on system. Press on **Volume increase** button during startup (as the Dell Logo appears) until the BOOT Menu screen is displayed.

i **NOTE:** Use the **Volume increase** button to navigate to respective diagnostic and press on **Volume decrease** button to select the required option.

Diagnostic LED

This section details the diagnostic features of the Latitude 7212 Rugged Tablet.

Instead of beep codes, errors are indicated via the **bicolor power-button LED**. A specific blink pattern is followed by flashing a pattern of flashes in amber, followed by white. The pattern then repeats.

i **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 seconds 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 0.5 seconds.

The system will not shut down when displaying the Diagnostic Error Codes. Diagnostic Error Codes will always supersede any other use of the LED. For instance, on Notebooks, battery codes for Low Battery or Battery Failure situations will not be displayed when Diagnostic Error Codes are being displayed:

Table 10. LED pattern

Blinking pattern		Problem Description	Fault(s)
Amber	White		
2	1	CPU	CPU failure
2	2	Motherboard: BIOS ROM failure	Motherboard, covers BIOS corruption, or ROM error
2	3	memory	no memory/no RAM detected
2	4	memory	memory failure/RAM failure
2	6	Motherboard: Chipset	Motherboard/Chipset Error
2	7	LCD	LCD failure

Table 10. LED pattern (continued)



Blinking pattern		Problem Description	Fault(s)
3	3	BIOS Recovery 1	Recovery Image not found
3	4	BIOS Recovery 2	Recovery Image found but invalid

General Troubleshooting

Table 11. General Troubleshooting

Issue	Suggested Troubleshooting Steps
Battery Charging	<p>The battery should be charged while the system is off for faster charge time. Users may notice longer charge times when the system is turned on and running graphics-intensive applications.</p> <p>⚠ CAUTION: There is a danger of a new battery exploding if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.</p>
No POST	<p>When a user starts the tablet, the first thing that the BIOS does is to perform the Power-On Self-Test (POST). The POST is a built-in diagnostic program that checks the hardware to make sure that everything is present and functioning properly, before the BIOS begins the actual boot.</p> <p>If the system does not perform a Power-On Self-Test, there are various things that you can look for:</p> <ol style="list-style-type: none"> 1. Check that the system has a power light. 2. If the system has no power light, make sure that it is plugged into AC power. 3. Remove the battery. Make sure that the power is turned off and the system is unplugged. 4. Remove all CRUs from the system and reconnect the AC adapter to the system and try again. 5. Run the ePSA diagnostics.
Video	<p>If the LCD on the system does not show any display or has other problems, here are some basic steps that you can perform:</p> <ol style="list-style-type: none"> 1. If the LCD is not displaying video or the video is garbled, run the ePSA diagnostics. 2. If the LCD is not displaying any video, connect an external monitor to eliminate a no-POST problem. A good image on the external monitor eliminates a video card problem or a POST problem. 3. Connect an external monitor, when possible, for all LCD-related problems to help eliminate a possible software or video card problem. 4. If the LCD has dim video, adjust the brightness or connect an AC adapter to eliminate a power management conservation setting in the BIOS. 5. If the LCD has lines on the screen, check the system during POST and system setup, to determine if the lines are present in all modes of operation. Run the ePSA diagnostics. 6. If the LCD has color problems, run the ePSA diagnostics. 7. If the LCD has burned-out pixels, verify that the LCD is still within LCD standard guidelines. For Dell internal users only, click here.
BIOS	<p>If users have problems while using the tablet, the problems may be related to BIOS settings configured incorrectly in BIOS/System Setup. Check the System Setup pages to verify the settings on each page. Try resetting BIOS to default settings by pressing Alt+F.</p>
Touchpad and Keyboard	<p>To troubleshoot touchpad and keyboard-related problems, you can perform the following steps:</p>

Table 11. General Troubleshooting (continued)

Issue	Suggested Troubleshooting Steps
	<ol style="list-style-type: none"> 1. Attach an external mouse or keyboard to check for peripheral functionality. 2. Run the ePSA diagnostics.
Integrated NIC	<p>If the system is not able to identify any network after connecting the network cable to the network port, try the following troubleshooting steps:</p> <ol style="list-style-type: none"> 1. Make sure that the network driver has been installed and is working properly. 2. Check that the network LEDs are responding. 3. Check System Setup to make sure that the NIC is enabled. 4. Try reseating the cable. 5. Try a known good cable, if one is available. 6. If a known good system is available, check if that system is connecting to the network. 7. Run the ePSA diagnostics on the network port. <p> NOTE: If the integrated network hardware solution is defective or nonfunctional, replace the system board.</p>
Display assembly	<p>No additional drivers or updates are needed for VGA functionality. When troubleshooting an external monitor, keep these tips in mind:</p> <ul style="list-style-type: none"> ● Check both ends of the cable for a snug connection into the laptop and into the external monitor. ● Adjust the contrast and brightness controls on the external monitor. ● Make sure that the tablet is not set to internal display only. ● Swap with a known good cable. ● Try with a known good external monitor. Check the external device's documentation for any additional steps required for functionality. <p> NOTE: If the display assembly is defective or nonfunctional, replace the defective components.</p>

Ecosystem Accessories

Key disassembly instructions along with important replacement instructions are called out to ensure the field technicians take into account this information before removing or replacing any components.

Topics:

- [Active Stylus](#)
- [Getting the stylus ready for use](#)
- [Setting the Stylus Mode](#)
- [System base view](#)
- [System right view](#)
- [Dock front view](#)
- [Keyboard Dock](#)
- [Dock rear view](#)
- [Input Output module](#)
- [Rugged tablet vehicle dock](#)

Active Stylus

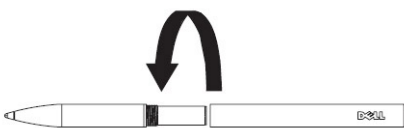
This section provides information about the features available on the active stylus.



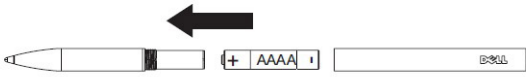
1. Pen lead provides the finger touch functionality.
2. Pen button used to perform a left-click and right-click.
3. Middle barrel provides access to the battery compartment.
4. Pen clip/Pen rear cap allows you to secure the stylus in your pocket.

Getting the stylus ready for use

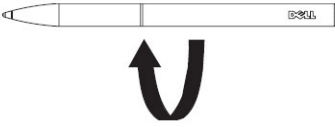
1. Twist the middle barrel in a counterclockwise direction.



2. Insert an AAAA battery with the positive side facing the tip of the pen.

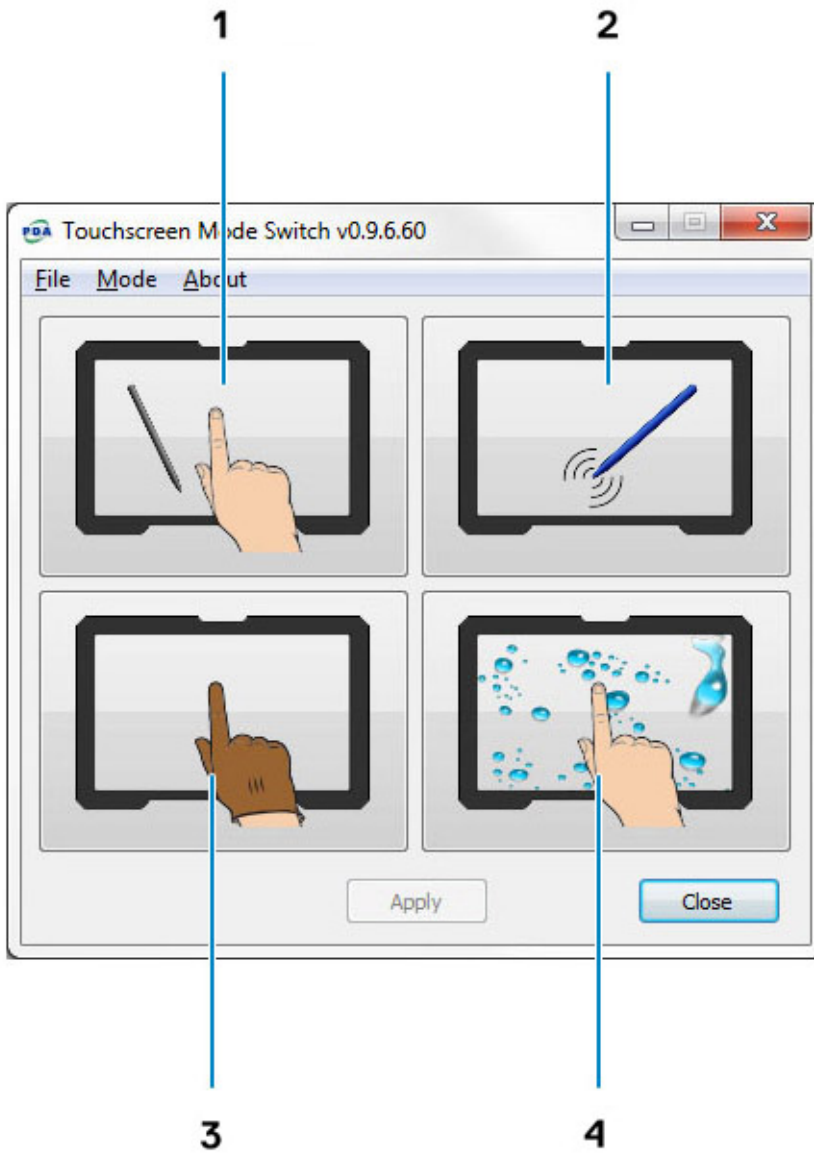


3. Reassemble the barrel securely.



Setting the Stylus Mode

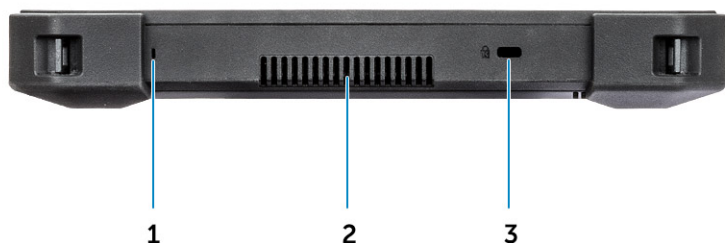
1. Click on start to launch the ModeSwitch.
2. Select the required mode.
 1. Finger (+ Passive Stylus)
 2. Active Pen (+ Finger & Passive Stylus)
 3. Glove
 4. Water



System base view

This section contains information on the desk dock.

System right view



1. Microphone
2. Quad Cool vent output
3. Security cable slot

Dock front view



1. Tablet Back Support
2. Alignment pins
3. Pogo-pin docking connector
4. Power indicator
5. USB 2.0 port
6. Headset jack

Keyboard Dock



IP-65 Rated Full-Size Keyboard

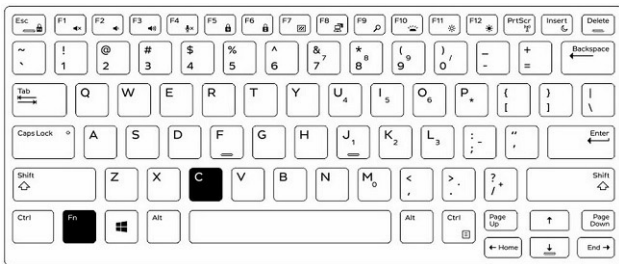
Ingress Protection (IP) ratings define levels of sealing effectiveness of electrical enclosures against intrusion. The digit 65 indicates that the rugged keyboard is enhanced with protection against dust and low-pressure water jets. To understand more on IP ratings, please refer to the Essential Knowledge page.

Backlit Keyboard

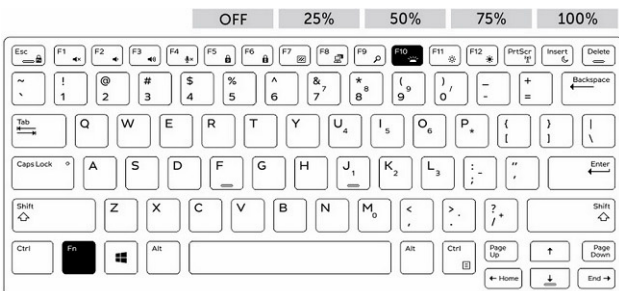
The keyboard dock comes equipped with a customizable backlit keyboard. The backlight can be set to any of the following colors:

- White
- Red
- Green
- Blue
- Custom color
- Custom color

The user can set the keyboard backlight behavior and customize colors. For more information, see the Backlit Keyboard page. Press **<Fn> + <C>** to cycle through the available backlight colors.



Turn the Backlight On - Off and Adjust Brightness

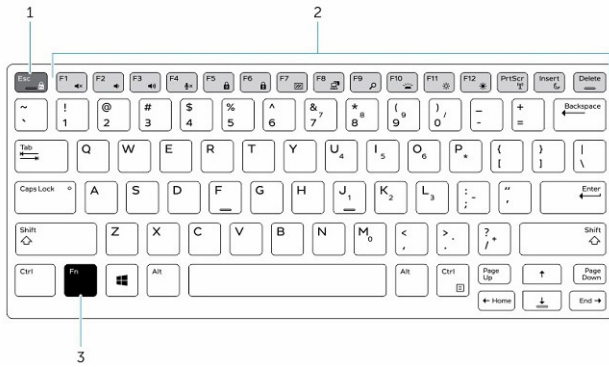


1. Press **<Fn> + <F10>** to activate the backlight feature.
2. The first use of the above key combination turns on the backlight to its lowest setting.

3. Additional cycling of the key combinations will vary the brightness settings to 25%, 50%, 75%, and 100%.
4. Cycle through the key combination to either adjust the brightness or completely turn off the backlight.

Keyboard Function - Fn Key Lock

The keyboard has Function key (**Fn**) lock capability. When activated, the secondary functions on the top row of keys become default and will not require use of the **<Fn>** key. While activated, use of the **<Fn>** key will trigger the **<F1>**, **<F2>**, **<F3>**, (and so on) keys.



1. **Fn** Lock key
2. Affected **Fn** keys
3. **Fn** key

NOTE: Fn Lock affects only these keys. Secondary functions will not require the **<Fn>** key to be pressed while enabled.

Complete the following steps to turn the **Fn** Lock on/off:

- a. Press **<Fn> + <Esc>** to enable the Fn lock.
- b. Secondary functions on keys in the top row will now be active with a single press of the keys. Use of the **<Fn>** key will trigger numbered function keys (**<F1>**, **<F2>**, **<F3>**, and so on).
- c. Other secondary functions on keys below the top row are not affected and will still require use of the **<Fn>** key
- d. The **Fn** lock can be turned off by pressing the **<Fn> + <Esc>** keys again. This will return the function keys to the default state.

Dock rear view



1. 2x Spare Battery Charging Slots
2. Lock slot (positioned on left side of dock)
3. DC-in jack
4. 2x Serial port
5. VGA port
6. Display port
7. 2x USB 3.0 port
8. Gigabit Ethernet

Input Output module

The extended Input Output (I/O) Module adds two USB 3.1 ports and an Ethernet port to your Rugged Tablet. The module attaches securely to the back of the tablet when additional ports are needed. Can be easily removed when the additional extended port is not required. I/O module expands the functionality of the tablet.

The I/O module includes:

- One ethernet port
- Two USB 3.1 connector



Installing I/O module:

1. Align the I/O Module at the back of the tablet.
2. Tighten up all four thumb screws.

Rugged tablet vehicle dock

This section contains information about the Rugged Vehicle Dock.

The Rugged Tablet Vehicle Dock is a unique docking solution specially designed for the Latitude 7212 Rugged Extreme Tablet. The dock mounts the tablet in optimal position for vehicle use. It is crash-tested to SAE J1455 standards, which offers the user unsurpassed peace of mind to use the tablet in vehicle. Few company manufactures customized in-vehicle mounting.

