



MS-C902

Industrial Data Machine

User Guide

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Revision

V1.0, 2022/12

Safety Information

- The components included in this package are prone to damage from electrostatic discharge (ESD). Please adhere to the following instructions to ensure successful computer assembly.
- Ensure that all components are securely connected. Loose connections may cause the computer to not recognize a component or fail to start.
- Hold the motherboard by the edges to avoid touching sensitive components.
- It is recommended to wear an electrostatic discharge (ESD) wrist strap when handling the motherboard to prevent electrostatic damage. If an ESD wrist strap is not available, discharge yourself of static electricity by touching another metal object before handling the motherboard.
- Store the motherboard in an electrostatic shielding container or on an anti-static pad whenever the motherboard is not installed.
- Before turning on the computer, ensure that there are no loose screws or metal components on the motherboard or anywhere within the computer case.
- Do not boot the computer before installation is completed. This could cause permanent damage to the components as well as injury to the user.
- If you need help during any installation step, please consult a certified computer technician.
- Always turn off the power supply and unplug the power cord from the power outlet before installing or removing any computer component.
- Keep this user guide for future reference.
- Keep this motherboard away from humidity.
- Make sure that your electrical outlet provides the same voltage as is indicated on the PSU, before connecting the PSU to the electrical outlet.
- Place the power cord such a way that people can not step on it. Do not place anything over the power cord.
- All cautions and warnings on the motherboard should be noted.
- If any of the following situations arises, get the motherboard checked by service personnel:
 - Liquid has penetrated into the computer.
 - The motherboard has been exposed to moisture.
 - The motherboard does not work well or you can not get it work according to user guide.
 - The motherboard has been dropped and damaged.
 - The motherboard has obvious sign of breakage.
- Do not leave this motherboard in an environment above 60°C (140°F), it may damage the motherboard.

Battery Information

Please take special precautions if this product comes with a battery.

- Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.
- Avoid disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery, which can result in an explosion.
- Avoid leaving a battery in an extremely high temperature or extremely low air pressure environment that can result in an explosion or the leakage of flammable liquid or gas.
- Do not ingest battery. If the coin/button cell battery is swallowed, it can cause severe internal burns and can lead to death. Keep new and used batteries away from children.

European Union:



Batteries, battery packs, and accumulators should not be disposed of as unsorted household waste. Please use the public collection system to return, recycle, or treat them in compliance with the local regulations.

BSMI:



廢電池請回收

For better environmental protection, waste batteries should be collected separately for recycling or special disposal.

California, USA:



The button cell battery may contain perchlorate material and requires special handling when recycled or disposed of in California.

For further information please visit:

<http://www.dtsc.ca.gov/hazardouswaste/perchlorate/>

Regulatory Notices

CE Conformity

Hereby, Micro-Star International CO., LTD declares that this device is in compliance with the essential safety requirements and other relevant provisions set out in the European Directive.



FCC-B Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the measures listed below:



- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

Notice 1

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2

Shielded interface cables and AC power cord, if any, must be used in order to comply with the emission limits.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

WEEE Statement

Under the European Union ("EU") Directive on Waste Electrical and Electronic Equipment, Directive 2012/19/EU, products of "electrical and electronic equipment" cannot be discarded as municipal waste anymore and manufacturers of covered electronic equipment will be obligated to take back such products at the end of their useful life.



Chemical Substances Information

In compliance with chemical substances regulations, such as the EU REACH Regulation (Regulation EC No. 1907/2006 of the European Parliament and the Council), MSI provides the information of chemical substances in products at:

<https://csr.msi.com/global/index>

Green Product Features

- Reduced energy consumption during use and stand-by
- Limited use of substances harmful to the environment and health
- Easily dismantled and recycled
- Reduced use of natural resources by encouraging recycling
- Extended product lifetime through easy upgrades
- Reduced solid waste production through take-back policy

Environmental Policy

- The product has been designed to enable proper reuse of parts and recycling and should not be thrown away at its end of life.
- Users should contact the local authorized point of collection for recycling and disposing of their end-of-life products.
- Visit the MSI website and locate a nearby distributor for further recycling information.
- Users may also reach us at gpcontdev@msi.com for information regarding proper disposal, take-back, recycling, and disassembly of MSI products.



Copyright and Trademarks Notice

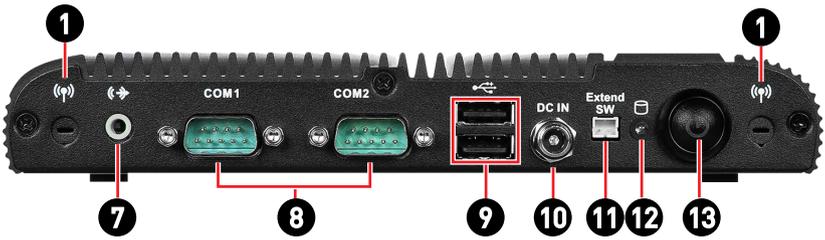
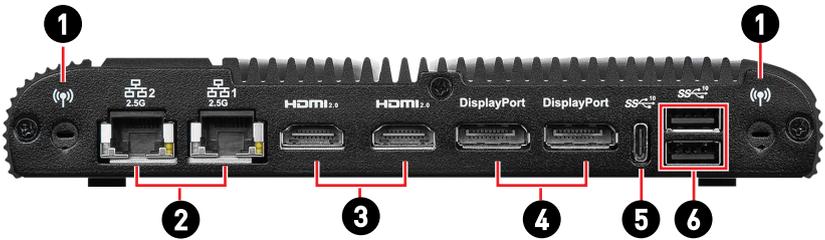
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Technical Support

If a problem arises with your product and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor. Alternatively, please visit <https://www.msi.com/support/> for further guidance.

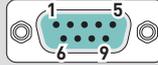
System Overview



<p>1</p>	<p>Wi-Fi Antenna Connector</p> <p>These connectors allow you to connect an external antenna for wireless communication. User may find two on each side of the system.</p>																		
<p>2</p>	<p>2.5 Gbps LAN Jack</p> <p>The standard RJ-45 LAN jack is provided for connection to the Local Area Network (LAN). You can connect a network cable to it.</p> <table border="1" data-bbox="203 359 926 582"> <tr> <td data-bbox="203 359 484 582" rowspan="6">  </td> <td data-bbox="484 359 665 391">LED</td> <td data-bbox="665 359 792 391">Status</td> <td data-bbox="792 359 926 391">Description</td> </tr> <tr> <td data-bbox="484 391 665 422" rowspan="3">Link/ Activity LED</td> <td data-bbox="665 391 792 422">○ Off</td> <td data-bbox="792 391 926 422">No link</td> </tr> <tr> <td data-bbox="665 422 792 454">● Yellow</td> <td data-bbox="792 422 926 454">Linked</td> </tr> <tr> <td data-bbox="665 454 792 486">● Blinking</td> <td data-bbox="792 454 926 486">Data activity</td> </tr> <tr> <td data-bbox="484 486 665 582" rowspan="3">Speed LED</td> <td data-bbox="665 486 792 518">○ Off</td> <td data-bbox="792 486 926 518">10/100 Mbps</td> </tr> <tr> <td data-bbox="665 518 792 550">● Green</td> <td data-bbox="792 518 926 550">1 Gbps</td> </tr> <tr> <td data-bbox="665 550 792 582">● Orange</td> <td data-bbox="792 550 926 582">2.5 Gbps</td> </tr> </table>		LED	Status	Description	Link/ Activity LED	○ Off	No link	● Yellow	Linked	● Blinking	Data activity	Speed LED	○ Off	10/100 Mbps	● Green	1 Gbps	● Orange	2.5 Gbps
	LED		Status	Description															
	Link/ Activity LED		○ Off	No link															
			● Yellow	Linked															
			● Blinking	Data activity															
	Speed LED		○ Off	10/100 Mbps															
		● Green	1 Gbps																
● Orange		2.5 Gbps																	
<p>3</p>	<p>HDMI™ Connector HDMI™ <small>HIGH-DEFINITION MULTIMEDIA INTERFACE</small></p> <p>Supports 4096x2304 @60Hz as specified in HDMI™ 2.0b.</p>																		
<p>4</p>	<p>DisplayPort 1.4a</p> <p>Supports a maximum resolution of 7680x4320 at 60Hz.</p>																		
<p>5</p>	<p>USB 3.2 Gen 2 Port (Type-C)</p> <p>This connector is provided for USB peripheral devices, providing power up to 5V/3A. (Speed up to 10 Gbps)</p>																		
<p>6</p>	<p>USB 3.2 Gen 2 Port</p> <p>This connector is provided for USB peripheral devices. (Speed up to 10 Gbps)</p>																		
<p>7</p>	<p>Line-Out Jack</p> <p>This connector is provided for headphones or speakers.</p>																		

RS232/422/485 Serial Port

The serial port is a 16550A high speed communications port that sends/ receives 16 bytes FIFOs. It supports barcode scanners, barcode printers, bill printers, credit card machine, etc.



8

RS232		
PIN	SIGNAL	DESCRIPTION
1	NDCD	Data Carrier Detect
2	NSIN	Signal In
3	NSOUT	Signal Out
4	NDTR	Data Terminal Ready
5	GND	Signal Ground
6	NDSR	Data Set Ready
7	NRTS	Request To Send
8	NCTS	Clear To Send
9	VCC_COM	VCC_COM

RS422		
PIN	SIGNAL	DESCRIPTION
1	422 TXD-	Transmit Data, Negative
2	422 TXD+	Receive Data, Positive
3	422 RXD+	Transmit Data, Positive
4	422 RXD-	Receive Data, Negative
5	GND	Signal Ground
6	NC	No Connection
7	NC	No Connection
8	NC	No Connection
9	NC	No Connection

RS485		
PIN	SIGNAL	DESCRIPTION
1	TXD-	Transmit Data, Negative
2	NC	No Connection
3	TXD+	Transmit Data, Positive
4	NC	No Connection
5	GND	Signal Ground
6	NC	No Connection
7	NC	No Connection
8	NC	No Connection
9	NC	No Connection

USB 2.0 Port

9

This connector is provided for USB peripheral devices, providing power up to 5V/1.5A. (Speed up to 480 Mbps)

DC Power Jack

10

Power supplied through this jack supplies power to the system.

<p>11</p>	<p>Extend Switch Header This header is provided for power switches.</p>										
<p>12</p>	<p> HDD Activity LED This indicator shows the activity status of the HDD. It flashes when the system is accessing data on the HDD and remains off when no disk activity is detected.</p>										
<p>13</p>	<p> Power Button/ Power LED Press the button to turn the system on or off.</p> <table border="1" data-bbox="203 451 926 584"> <tr> <td data-bbox="267 480 346 560" rowspan="3">  </td> <td data-bbox="412 456 524 480">LED Status</td> <td data-bbox="575 456 687 480">Description</td> </tr> <tr> <td data-bbox="412 488 469 512">○ Off</td> <td data-bbox="575 488 886 512">ACPI S4/ S5/ Deep S5, Power Off</td> </tr> <tr> <td data-bbox="412 520 522 544">◐ Blinking</td> <td data-bbox="575 520 652 544">ACPI S3</td> </tr> <tr> <td data-bbox="412 552 447 576">● Green</td> <td data-bbox="575 552 652 576">ACPI S0</td> <td></td> </tr> </table>		LED Status	Description	○ Off	ACPI S4/ S5/ Deep S5, Power Off	◐ Blinking	ACPI S3	● Green	ACPI S0	
	LED Status		Description								
	○ Off		ACPI S4/ S5/ Deep S5, Power Off								
	◐ Blinking	ACPI S3									
● Green	ACPI S0										

Specifications

Model	MS-C902
Processor	<ul style="list-style-type: none"> • Intel® Alder Lake-P Platform U Series Processor
Memory	Controller within processor <ul style="list-style-type: none"> • 2 x DDR4 SO-DIMM slots <ul style="list-style-type: none"> - Dual Channel for DDR4, Non-ECC - Up to 3200 MT/s - Up to 64 GB
Network	2 x Intel® I226-LM 2.5GbE RJ-45 LAN (Co-lay I226-V)
Audio	Realtek® ALC888S High Definition Audio codec (Co-lay ALC897)
Graphics	Engine within processor <ul style="list-style-type: none"> • 2 x HDMI™ 2.0b up to 4096x2304 @60Hz • 2 x DP 1.4a up to 7680 x 4320 @60Hz <ul style="list-style-type: none"> - Supports DP++, High Bit Rate 3 • 4 independent display modes (2 x HDMI™, 2 x DP)
Storage	Controller within processor <ul style="list-style-type: none"> • 1 x SATA 3.0 (6Gb/s) port <ul style="list-style-type: none"> - Hot-plug supported • 1 x M.2 M Key (2242/ 2280) slot <ul style="list-style-type: none"> - With PCIe Gen 4 x4 NVMe & SATA 3.0 signals - Supports M/ B + M Key SSD devices • AHCI/ RAID 0/ RAID 1 <ul style="list-style-type: none"> - For SATA storage + M.2 M Key storage devices
Expansion Slots	<ul style="list-style-type: none"> • 1 x M.2 B Key (2242/ 3042) slot <ul style="list-style-type: none"> - With PCIe x1, USB 3.2 Gen 2, USB 2.0 signals - Shared with Nano SIM Holder • 1 x M.2 E Key (2230) slot <ul style="list-style-type: none"> - With PCIe x1 & USB 2.0 signal - Supports CNVi • 1 x Nano SIM Holder <ul style="list-style-type: none"> - Shared with M.2 B key (SIM) slot
Wireless Connection	Wi-Fi/ Bluetooth/ 4G/ 5G
Power Solution	<ul style="list-style-type: none"> • 19V DC-in power connector, lockable

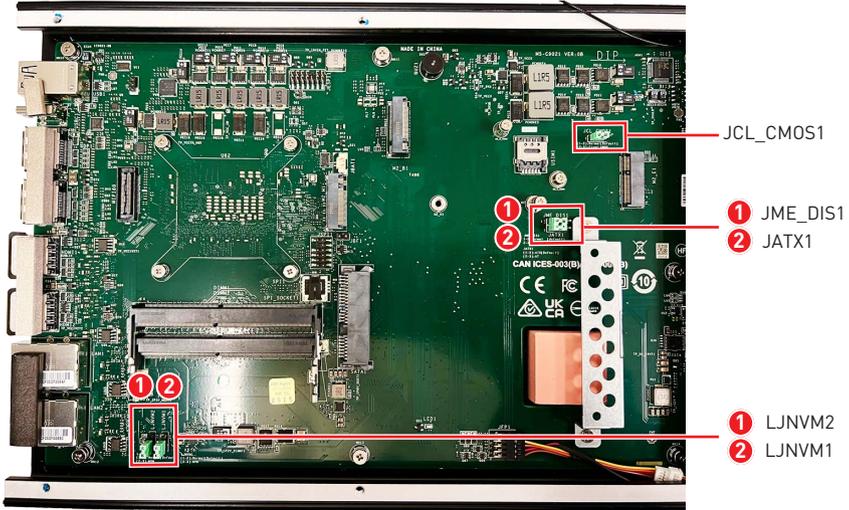
Model	MS-C902
Right Panel I/O	<ul style="list-style-type: none"> • 2 x Antenna connectors • 2 x RJ-45 2.5 GbE LAN ports • 2 x HDMI™ connectors • 2 x DisplayPorts • 1 x USB 3.2 Gen 2 Type-C connector (5V/3A) • 1 x Dual USB 3.2 Gen 2 Type-A connector (5V/1.5A)
Left Panel I/O	<ul style="list-style-type: none"> • 2 x Antenna connectors • 1 x Line-Out jack • 2 x RS232/ 422/ 485 Serial ports <ul style="list-style-type: none"> - 0V/ 5V/ 12V, 0.5A each port (selection by BIOS control, default: 0V) • 1 x Dual USB 2.0 Type-A connector (5V/1.5A) • 1 x DC power jack • 1 x Extend switch header • 1 x Hard disk drive (HDD) LED • 1 x Power button/ Power LED
Dimension	285mm (W) x 196mm (D) x 29mm (H)
Weight	2.24kg
Mounting	VESA mount
Accessories	<ul style="list-style-type: none"> • 1 x 19V, 90W Power Adapter • 1 x EU Power Cord (by BOM option) • 1 x USA Power Cord (by BOM option) • 1 x VESA Mounting Bracket • 4 x VESA Mounting Screws • 2 x Antennas for WiFi/BT Module
OS Support	Windows 10 IoT Enterprise 2021 LTSC (64-bit, 21H2)
Regulatory Compliance	FCC Class B / CE / RCM / BSMI / VCCI / UKCA / IC / RoHS Compliant
Environment	<ul style="list-style-type: none"> • Operating Temperature <ul style="list-style-type: none"> - -10 ~ 50°C (SSD) • Storage Temperature <ul style="list-style-type: none"> - -20 ~ 80°C • Humidity: 10 ~ 90%, non-condensing • Vibration: IEC 60068-2-64: 2 Grms, 5 ~500 Hz, 1hr/axis (w/ SSD) • Shock: IEC 60068-2-27: 50G, half sine, 11ms (w/ SSD)

Motherboard Jumper



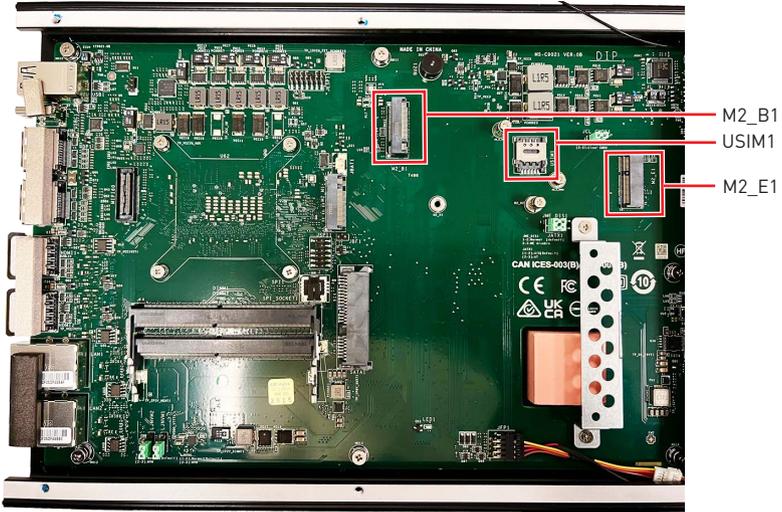
Important

Avoid adjusting jumpers when the system is on; it will damage the motherboard.



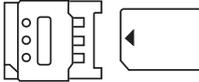
Jumper Name	Default Setting	Description
JCL_CMOS1	1	Clear CMOS Jumper
		1-2: Normal (Default)
		2-3: Clear CMOS
JME_DIS1	1	ME Jumper
		1-2: Normal (Default)
		2-3: ME disable
JATX1	1	ATX Mode Select Jumper
		1-2: ATX mode (Default)
		2-3: AT mode
LJNVMS1 LJNVMS2	1	NVM Jumper
		1-2: Normal (Default)
		2-3: NVM

Expansion Slot



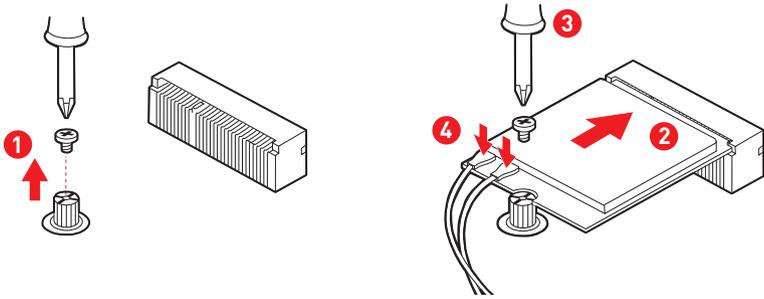
USIM1: Nano SIM Holder

This holder is provided for 3G, 4G, LTE, 5G Nano SIM cards.



M.2 Slot (E Key, 2230)

Please install the Wi-Fi/ Bluetooth card into the M.2 slot as shown below.

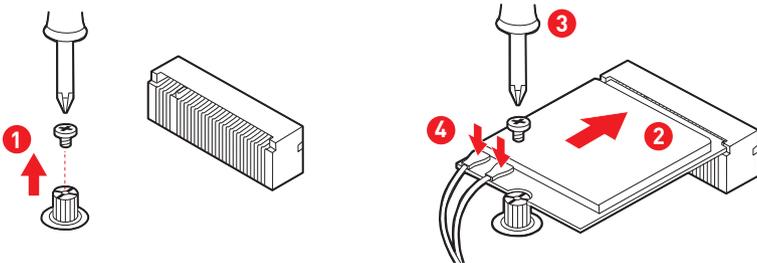


Feature

- Supports PCIe x 1 & USB 2.0 signal.
- Supports CNVi

M.2 Slot (B Key, 2242/ 3042)

Please install the WWAN Card/ solid-state drive (SSD) into the M.2 slot as shown below.



Feature

- Supports PCIe x 1, USB 3.2 Gen 2, USB 2.0 signals.

Getting Started



Important

All information is subject to change without prior notice.

Necessary Tools



Screwdriver



Pliers



Tweezers



Anti-Static Gloves

Safety Precautions

The following precautions should be observed while handling the system:

- Place the system on a flat and stable surface.
- Do not place the system in environments subject to mist, smoke, vibration, excessive dust, salty or greasy air, or other corrosive gases and fumes.
- Do not drop or jolt the system.
- Do not use another power adapter other than the one enclosed with the system.
- Disconnect the power cord before performing any installation procedures on the system.
- Do not perform any maintenance with wet hands.
- Prevent foreign substances, such as water, other liquids or chemicals, from entering the system while performing installation procedures on the system.
- Use a grounded wrist strap before handling system components such as CPU, Memory, HDD, expansion cards, etc.
- Place system components on a grounded antistatic pad or on the bed that came with the components whenever the components are separated from the system.



Important

The system photos are provided for demonstration of system assembly only. The internal view of your system may vary depending on the model you purchased.

Removing System Cover



Before you remove or install any components, make sure the system is not turned on or connected to the AC power.

1. Place the system on a flat and steady surface. Locate the screw on the back side, and slightly pull aside to uncover the system.



2. Remove the cover carefully, and set the cover and screw aside for later use.



- Follow the above procedures in reverse order to install the cover.

Installing Memory Module

1. Locate the SO-DIMM slot.



2. Align the notch on the memory module with the key on the slot and insert the memory module into the slot at a 45-degree angle.



3. Push the memory module gently downwards until the slot clips click and lock the memory module in place.



-
4. Install more DIMMs if necessary.



- To uninstall the DIMM, flip the slot levers outwards and the DIMM will be released instantly.

 **Important**

- You can barely see the golden finger if the DIMM is properly inserted in the DIMM slot.
- Always insert memory modules in the lower slot first.
- To ensure system stability for Dual channel mode, memory modules must be of the same type, number and density.

Installing SSD (M.2 M-Key Slot)

1. Locate the SSD slot.



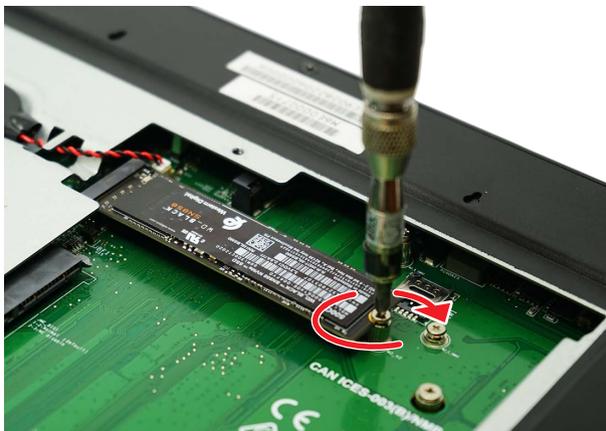
2. Unlock the SSD screw, and keep the screw for later use.



3. Align the notch on the SSD with the key on the slot and insert the SSD into the slot.



-
4. Push down the SSD and lock it with the screw.



- Follow the above procedures in reverse order to replace the SSD if needed.
-

Installing Wi-Fi Card (M.2 E-Key Slot)

1. Locate the M.2 slot.



2. Unlock the M.2 card screw if needed, and keep the screw for later use.



3. Align the notch on the M.2 card with the key on the slot, then insert the card in at 45-degree angle.

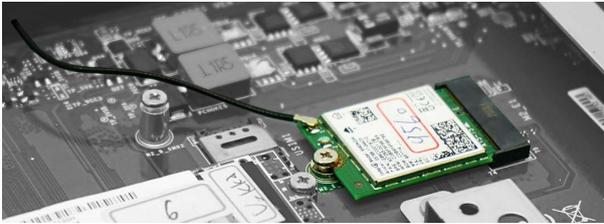


-
4. Push the card down and secure it with a screw.

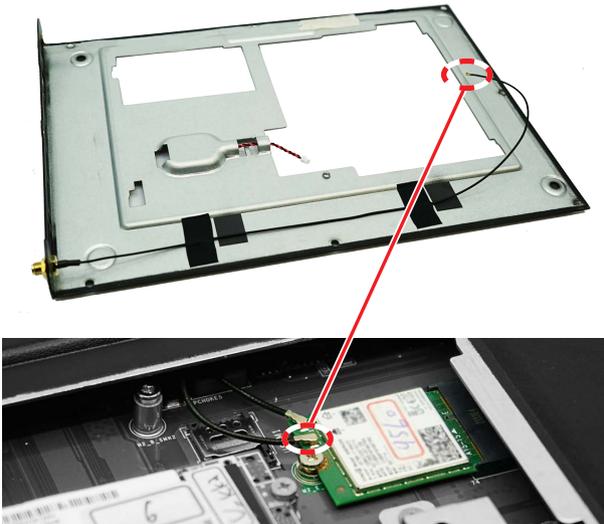


- Follow the above procedures in reverse order to replace the Wi-Fi card if needed.

5. Find the antenna cable, than gently push down to connect it.

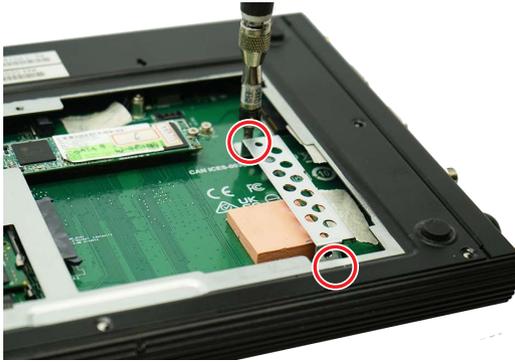


6. Use acetate cloth electrical tape to secure another antenna cable on the back side of the case, then connect it to the Wi-Fi card.



Installing 2.5" HDD/ SDD (7mm)

1. Remove the bracket by unlocking 2 screws, and keep the screws for later use.



2. To install, first insert the SSD into the bracket with screw holes aligned. Then tighten the screws to fix the SSD to the bracket.

Available Upon Request:

2 **optional** screws are available to secure the HDD/ SSD to the bracket.

Important

Before assembly, please make sure the HDD/SSD is compatible with the bracket.



3. Align the SATA data & power connectors and connect the SSD to the system.



-
1. Fasten the HDD bracket to the system with 2 screws.



- Follow the above procedures in reverse order to replace the HDD if needed.
-

Removing System Case

1. Unplug the battery connector.



2. Remove the screws on the back side.



3. Remove the screws on the right side.



-
4. Carefully pull to remove the case, and set the case and screws aside for later use.



- *Follow the above procedures in reverse order to install the cover.*

Installing WWAN Card (M.2 B-Key Slot)

1. The M.2 B-Key slot can be found after **removing the system case**.
 - Please refer to the previous page for instructions on removing the system case.



2. Unlock the screw, and keep the screw for later use.



3. Align the notch on the WWAN Card with the key on the slot and insert the card into the slot.



-
4. Push down the card and lock it with the screw.



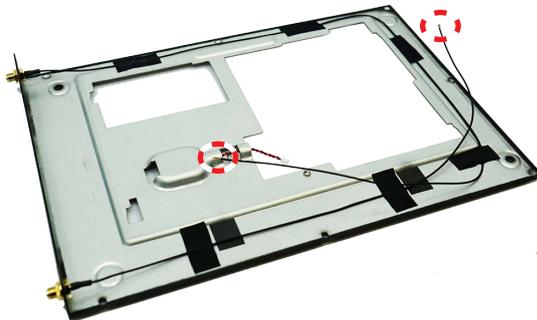
- *Follow the above procedures in reverse order to replace the SSD if needed.*
-

Cable Connection for 5G Card (M.2 B-Key Slot)

1. Open the case.
 - For instructions, please refer to **Removing System Case** chapter.
2. Find two antenna cables, than gently push down to connect it.



3. Use acetate cloth electrical tape to secure the other two antenna cables on the back side of the case, then connect it to the 5G card.



VESA Mount

Installation

- Connect your cables to the system.
- Mount your system onto the VESA mount plate.

Removal

- Dismount your system from the VESA mount plate.
- Disconnect your cables from the system.



-
1. Locate the VESA mount screw holes on the back of the monitor.
 2. Fasten the VESA mount plate to the monitor with the supplied screws.
 3. Mount the system onto the VESA mount plate.
 4. Tighten the thumbscrew at the bottom of the VESA mount plate to secure the system.
 5. Locate the wireless LAN antenna connector and install the antenna.
 6. Connect the signal cable from the monitor to the system.
 7. Connect the monitor power cord.
 8. Assemble the system power adapter and the power cord. Connect the power adapter to the system and then connect the power cord to the electrical outlet.

Important

We suggest that you connect the power adapter to your system first and then connect the power cord to the socket-outlet for safety concerns.

9. Turn on the monitor and power on the system.
-