

# **AIG-500 Series Hardware User's Manual**

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# AIG-500 Series Hardware User's Manual

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## Introduction

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The AIG-500 Series advanced IIoT gateways are designed for Industrial IoT applications, especially for distributed and unmanned sites in harsh operating environments. ThingsPro Edge and Azure IoT Edge software are preloaded and seamlessly integrated with the AIG-500 Series to enable easy, reliable, yet secure sensor-to-cloud connectivity for data acquisition and device management using the Azure Cloud solution. With the use of the ThingsPro Proxy utility, the device provisioning process is easier than ever. Thanks to the robust OTA function, you never have to worry about system failure during software upgrades. With the secure boot function enabled, you can enable the booting process of AIG-500 Series to prevent malicious software injection.

The following topics are covered in this chapter:

- ❑ **Model Descriptions**
- ❑ **Package Checklist**
- ❑ **Product Features**
- ❑ **Product Specifications**

# Model Descriptions

The AIG-500 Series includes the following models:

- **AIG-501-T-AZU-LX:** Advanced IIoT gateway with Intel Atom® quad-core 1.91 GHz processor, 1 VGA port, 4 DIs, 4 DOs, ThingsPro Edge and Azure IoT Edge software, -40 to 70°C operating temperature
- **AIG-501-T-US-AZU-LX:** Advanced IIoT gateway with Intel Atom® quad-core 1.91 GHz processor, 1 VGA port, 4 DIs, 4 DOs, USA LTE band, ThingsPro Edge and Azure IoT Edge software, -40 to 70°C operating temperature
- **AIG-501-T-EU-AZU-LX:** Advanced IIoT gateway with Intel Atom® quad-core 1.91 GHz processor, 1 VGA port, 4 DIs, 4 DOs, Europe LTE band, ThingsPro Edge and Azure IoT Edge software, -40 to 70°C operating temperature
- **AIG-501-T-AP-AZU-LX:** Advanced IIoT gateway with Intel Atom® quad-core 1.91 GHz processor, 1 VGA port, 4 DIs, 4 DOs, Asia Pacific LTE band, ThingsPro Edge and Azure IoT Edge software, -40 to 70°C operating temperature

# Package Checklist

The package contains the following items:

- AIG-500 Series advanced IIoT gateway
- Power jack
- Quick installation guide (printed)
- Warranty card

**NOTE** Notify your sales representative if any of the above items are missing or damaged.

**NOTE** Neither the wall mounting kit nor DIN-rail mounting kit come with the package. They must be purchased separately as needed.

# Product Features

- Simplifies data acquisition and device management via the ThingsPro Edge software.
- Seamless integration with ThingsPro Edge and Azure IoT Edge enables easy, reliable, yet secure cloud connectivity.
- Supports easy device-provisioning with the ThingsPro Proxy utility.
- Provides robust OTA function to prevent system failure during software upgrades.
- Equipped with secure boot to prevent malicious software-injection attacks.

# Product Specifications

**NOTE** The latest specifications for Moxa's products can be found at <https://www.moxa.com>.

# Hardware Introduction

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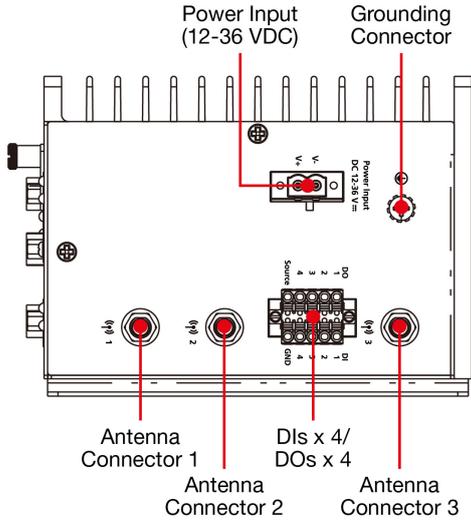
The AIG-500 Series devices are compact and rugged, making them suitable for industrial applications. The LED indicators allow you to monitor device performance and quickly identify issues, and the multiple ports can be used to connect a variety of devices. The AIG-500 Series comes with a reliable and stable hardware platform that lets you devote the bulk of your time to application development. In this chapter, we provide basic information about the device's hardware and its various components.

The following topics are covered in this chapter:

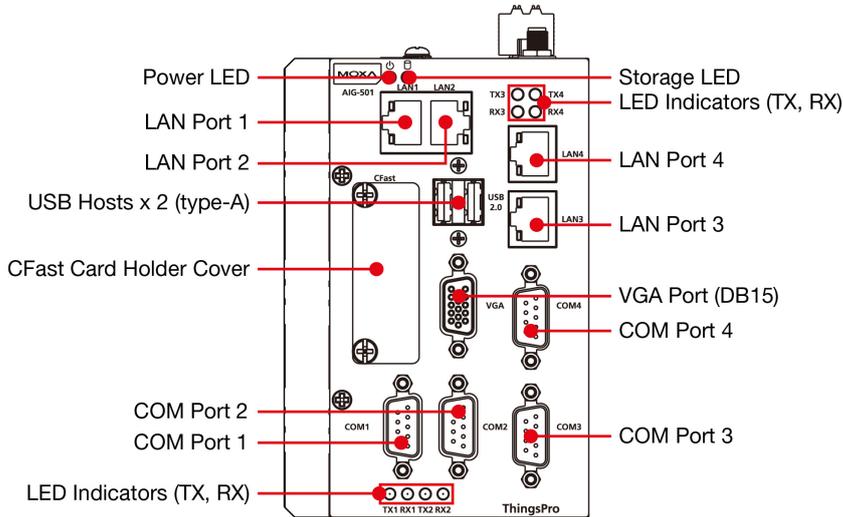
- ❑ **Appearance**
- ❑ **Dimensions**
- ❑ **LED Indicators**
- ❑ **Reboot**
- ❑ **Reset to Default**
- ❑ **Real-time Clock**
- ❑ **Installation Options**
  - DIN-rail Mounting (optional)
  - Wall Mounting (optional)

# Appearance

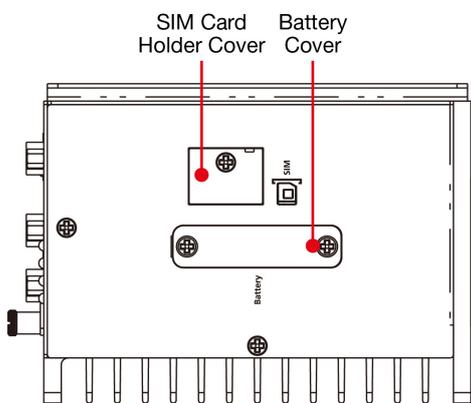
## Top Panel View



## Front Panel View

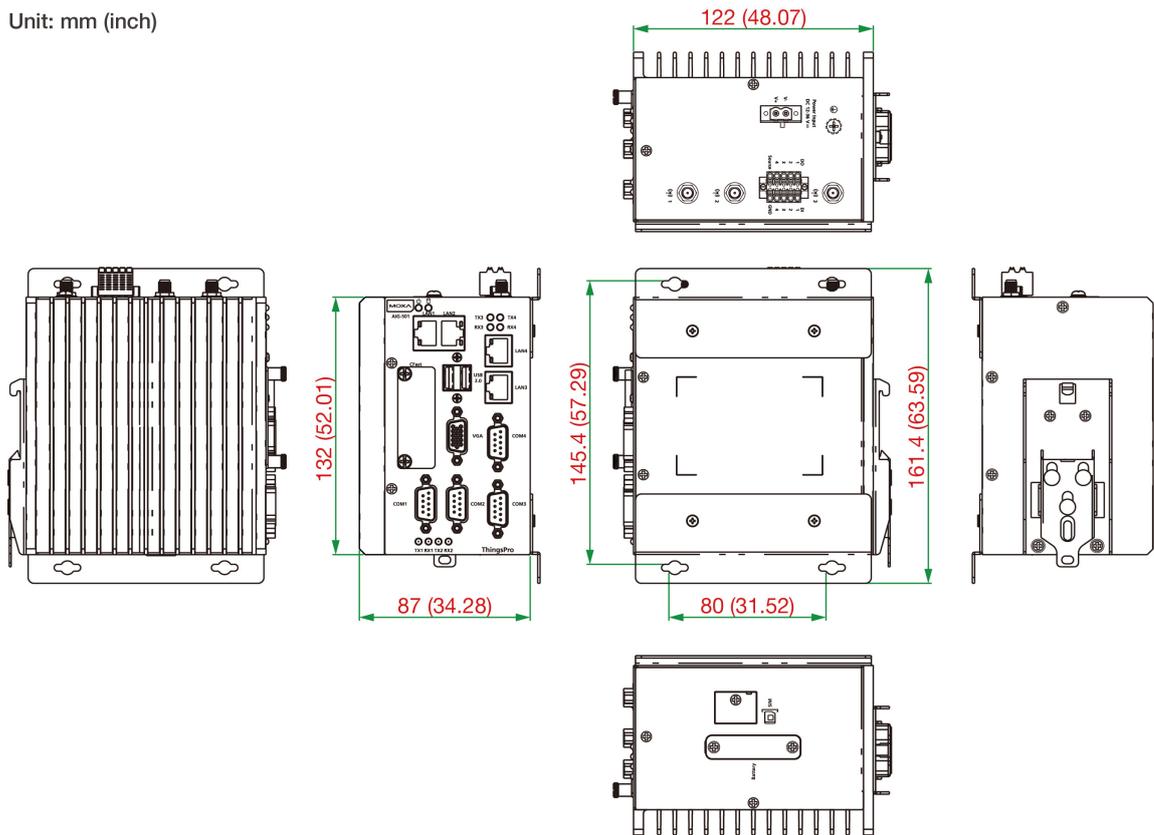


## Bottom Panel View



# Dimensions

Unit: mm (inch)



# LED Indicators

The function of each LED is described in the table below:

LED Name	Status	Function	
Power	Green	Power is ON	
	OFF	No power	
Storage (CFast)	Yellow	Blinking	Data is being written to or read from the storage
	OFF	No activity	
LAN1/LAN2/LAN3/LAN4 (RJ45 connector)	Green	Steady ON	100 Mbps Ethernet link
		Blinking	Data is being transmitted or received
	Yellow	Steady ON	1000 Mbps Ethernet link
		Blinking	Data is being transmitted or received
OFF	No Ethernet connection or 10 Mbps Ethernet link		
TX1/TX2/TX3/TX4	Green	Blinking	Data is being transmitted
	OFF	No data is being transmitted	
RX1/RX2/RX3/RX4	Yellow	Blinking	Data is being received
	OFF	No data is being received	

# Reboot

To reboot the device, refer to ThingsPro Edge user manual to execute the Reboot function. No hardware button is available for rebooting the device.

## Reset to Default

Refer to ThingsPro Edge user manual to execute Reset to Default function. No hardware button is available for resetting the device to factory default.

## Real-time Clock

The real-time clock is powered by a non-chargeable battery. We strongly recommend that you do not replace the lithium battery without help from a qualified Moxa support engineer. If you need to change the battery, contact the Moxa RMA service team.



### WARNING

There is a risk of explosion if the battery is replaced with an incorrect type.

## Installation Options

### DIN-rail Mounting (optional)

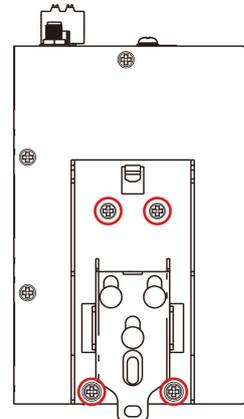
The optional DIN-rail mounting kit is not included in the product package and must be purchased separately.

Follow these steps to mount the device on to a DIN rail:

#### Installation

##### STEP 1:

Use 4 screws to attach the DIN-rail mounting bracket to the AIG-500's rear panel and tighten the screws to secure the bracket.

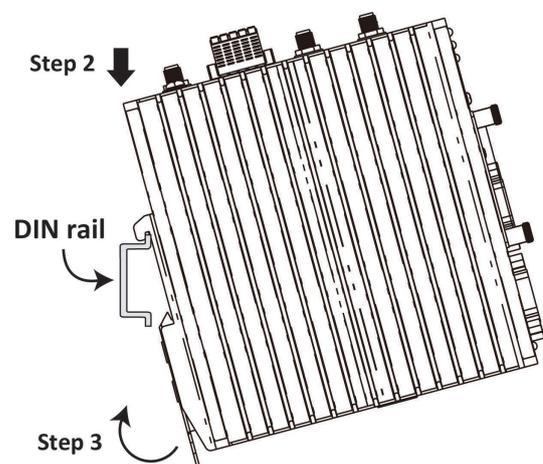


##### STEP 2:

Insert the upper lip of the DIN rail into the DIN-rail mounting kit.

##### STEP 3:

Press the AIG-500 towards the DIN rail until it snaps into place.



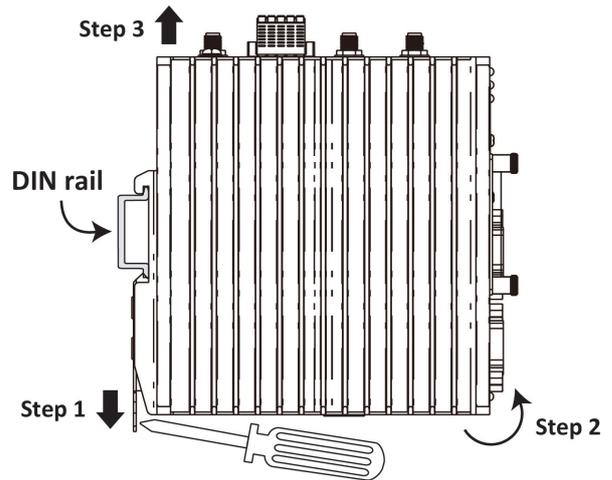
**Removal**

**STEP 1:**

To unmount the AIG-500, pull down the latch provided at the base of the mounting kit with a screwdriver.

**STEPS 2 & 3:**

Slightly pull the AIG-500 forward and lift it up to detach it from the DIN rail.



**Wall Mounting (optional)**

The optional wall-mounting kit is not included in the product package and should be purchased separately.

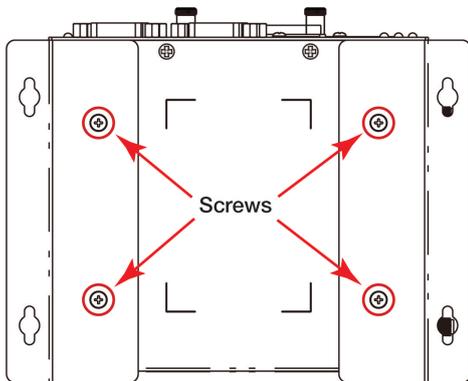
Follow these steps to mount the device on to a wall:

**STEP 1:**

Attach the wall-mounting brackets to the rear side of the AIG-500 by using two screws per bracket.

**STEP 2:**

Use four screws per side on the wall-mounting bracket to attach the AIG-500 to a wall or cabinet.



**IMPORTANT!**

The diameter of the screw heads should be greater than 7 mm and less than 14 mm; the diameter of the shafts should be less than 3 mm. The length of the screws should be greater than 6 mm.

**NOTE**

- Test the screw head and shank size by inserting the screws into one of the keyhole shaped apertures of the wall-mounting plates before attaching the plate to the wall.
- Do not drive the screws in all the way—leave a space of about 2 mm to allow room for sliding the wall mount panel between the wall and the screws.

# Hardware Connection Description

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In this chapter, we describe how to connect the AIG-500 to a network and other devices.

The following topics are covered in this chapter:

- ❑ **Wiring Requirements**
  - Connecting the Power
  - Grounding the Unit
- ❑ **Connecting to the Network**
- ❑ **Connecting to a USB Device**
- ❑ **Connecting to Serial Ports**
- ❑ **Connecting the Digital Inputs and Digital Outputs**
- ❑ **Inserting the SIM Card**
- ❑ **Installing the Wi-Fi Module (AIG-501-T-AZU-LX only)**
- ❑ **Connecting the Antennas**

## Wiring Requirements

In this section, we describe how to connect various devices to the AIG-500. Be sure to read and follow these common safety precautions before proceeding with the installation of any electronic device:

- Use separate paths to route wiring for power and devices. If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the intersection point.

**NOTE** Do not run signal or communication wiring and power wiring in the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.

- You can use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wiring that shares similar electrical characteristics can be bundled together.
- Keep input wiring and output wiring separate.
- When necessary, it is strongly advised that you label wiring to all devices in the system.



### ATTENTION

#### Safety First!

Be sure to disconnect the power cord before doing installations and/or wiring.

#### Electrical Current Caution!

Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size.

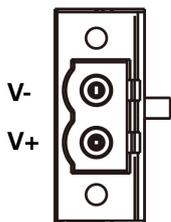
If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

#### Temperature Caution!

Be careful when handling the unit. When the unit is plugged in, the internal components generate heat, and consequently the outer casing may feel hot to the touch.

## Connecting the Power

**Power Input**  
DC 12-36 V



Connect the power jack (in the package) to the DC terminal block (located on the top panel), and then connect the power adapter. It takes about 3 minutes for the system to boot up. Once the system is ready, the power LEDs will light up.



### WARNING

- This product is intended to be supplied by a UL Listed Power Adapter or DC power source marked "L.P.S." (or "Limited Power Source") rated 12 to 36 VDC, 2.5 A (minimum), and TMA = 70°C (minimum).
- The power adapter should be connected to a socket outlet with an earthing connection.

If you need further information or assistance, contact a Moxa representative.

## Grounding the Unit

There is a grounding connector on the top panel of the device. Use this connector to connect a well-grounded mounting surface, such as a metal panel. Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI).



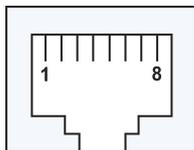
### ATTENTION

A shielded power cord is required to meet the FCC emission limits and to prevent interference with nearby radio and television reception. It is essential that only the supplied power cord be used.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

## Connecting to the Network

The Ethernet ports are located on the front panel of the device. The pin assignments for the Ethernet port are shown in the following figure. If you are using your own cable, make sure that the pin assignments on the Ethernet cable connector match the pin assignments on the Ethernet port.



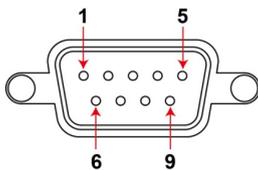
Pin	10/100 Mbps	1000 Mbps
1	Tx+	TRD(0)+
2	Tx-	TRD(0)-
3	Rx+	TRD(1)+
4	-	TRD(2)+
5	-	TRD(2)-
6	Rx-	TRD(1)-
7	-	TRD(3)+
8	-	TRD(3)-

## Connecting to a USB Device

The device comes with USB port, allowing users to connect to a device with an USB interface. The USB port uses a type-A connector.

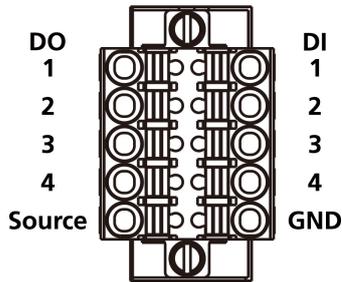
## Connecting to Serial Ports

The serial port can be configured by software for RS-232, RS-422, or RS-485. The pin assignments for the port are shown in the following table:



Pin	RS-232	RS-422/ RS-485 4-wire	RS-485 2-wire
1	-	TxD-(A)	-
2	RxD	TxD+(B)	-
3	TxD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	-	-
7	RTS	-	-
8	CTS	-	-

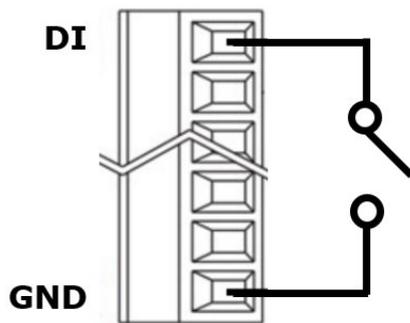
# Connecting the Digital Inputs and Digital Outputs



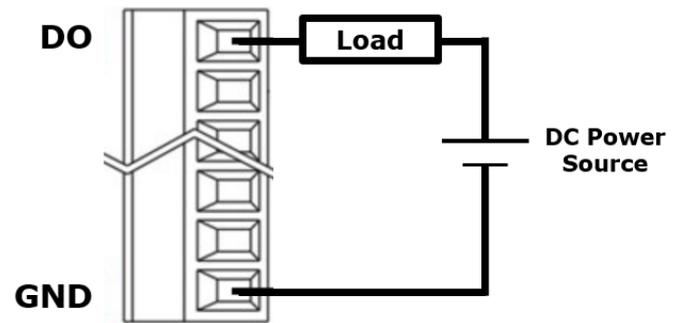
There are four digital inputs and four digital outputs on the top panel. Refer to the figure on the left for detailed pin definitions.

**NOTE** Do not use the Source port for safety reasons.

## DI Dry Contact



## DO Channel (Sink Type)



# Inserting the SIM Card

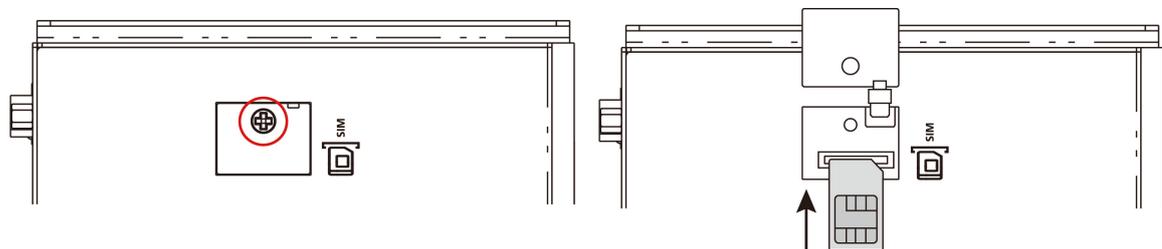
The device comes with a SIM card socket that allows users to install SIM card for cellular communication.

**STEP 1:**

Remove the screw on the SIM card holder cover located on the bottom panel of the device.

**STEP 2:**

Insert the SIM card into the socket. Make sure you insert in the right direction. To remove the SIM card, press the SIM card in to release and then you can pull out the SIM card.



# Installing the Wi-Fi Module (AIG-501-T-AZU-LX only)

The optional Wi-Fi wireless module is not included in the product package and must be purchased separately.

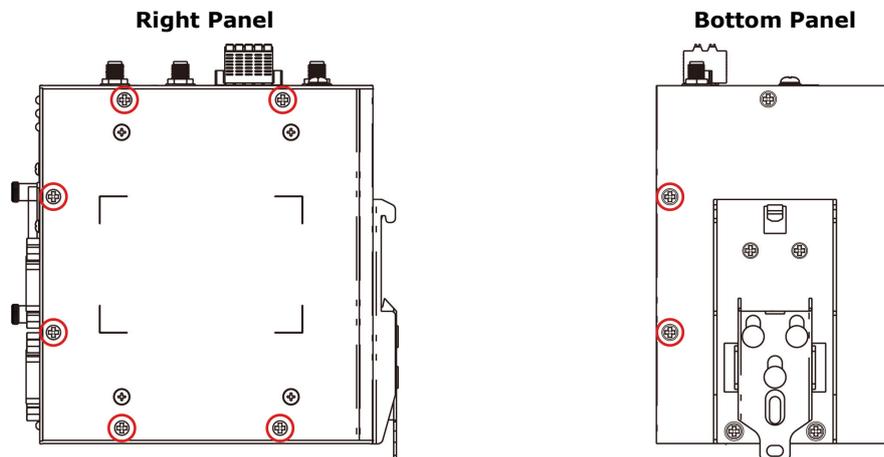
The Wi-Fi wireless module package contains the following items:

- 1 x Wi-Fi module
- 1 x thermal pad
- 2 x sliver screws (M2.5 x 6 mm)
- 2 x sliver screws (M2 x 2.5 mm)
- 1 x insulation pad
- 1 x Mini PCIe half-card fix board

**NOTE** Notify your sales representative if any of the above items are missing or damaged.

Follow these steps to install the Wi-Fi module for the device.

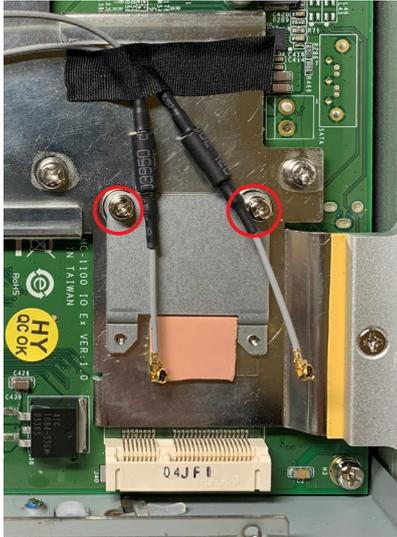
1. Loosen the six screws on the right panel and two screws on the bottom panel of your computer.



2. Remove the right cover to expose the Mini PCIe socket.
3. Remove the plastic sheet on the thermal pad and stick the thermal pad as indicated.



4. Install the Mini PCIe half-card fix board and secure it with the two silver screws (M2.5 x 6 mm).



5. Insert the wireless module card into the socket at an angle.
6. Push down the wireless module card and use two screws (M2 x 2.5 mm) to secure it on to the card.



7. Remove the plastic protection covers on the antenna connectors.

8. Connect the #1 SMA cable to the Main connector and #2 SMA cable to the Aux connector on the wireless module card.



9. Stick a piece of insulation tape on the connectors as indicated.



10. Put back the right cover and secure it with screws.

## Connecting the Antennas

For the US, EU, or AP LTE models, there are two cellular antenna connectors (#1: Main and #2: Aux) and a GPS connector (#3) on the top panel of the device. All three connectors are of SMA type.

For the non-LTE model, there are two Wi-Fi antenna connectors (#1: Main and #2: Aux) on the top panel of the device. Both connectors are of RP-SMA type.

# A

## Regulatory Approval Statements

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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.

**Class A:** FCC Warning! This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. 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. Operation of this equipment in a residential area is likely to cause harmful interference in which case the users will be required to correct the interference at their own expense.



**European Community**



### **WARNING**

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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