UC-8540 Series
Quick Installation Guide

Version 1.2, June 2024

Technical Support Contact Information
www.moxa.com/support

P/N: 1802085400012

Overview

The UC-8540 Series computer is a programmable communication-centric gateway offering a rich variety of communication interfaces, such as Ethernet, serial, and wireless communication. This EN 50155 compliant computer is built for rail applications and comes with multiple wireless interfaces making it an ideal choice for building wireless communication infrastructure with 802.11a/b/g/n/ac and LTE data transmission.

Model Names and Package Checklist

The UC-8540 Series includes the following models:

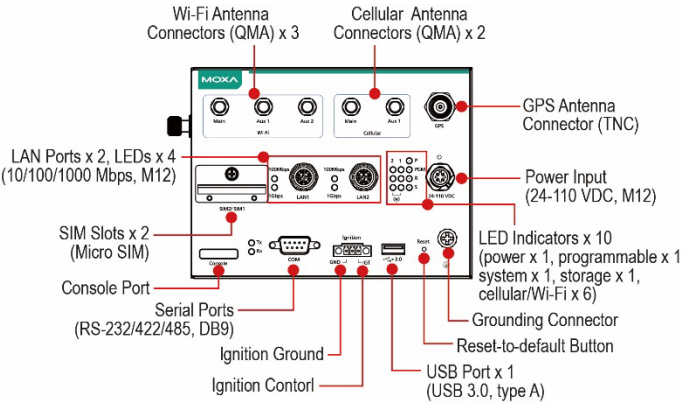
Available Models	Operating Temperature	Conformal Coating	Stand-alone GPS
UC-8540-LX	-25 to 55°C (-13 to 131°F)	–	–
UC-8540-T-LX	-40 to 70°C (-40 to 158°F)	–	–
UC-8540-T-CT-LX	-40 to 70°C (-40 to 158°F)	–	–

Before you install the UC-8540 Series computer, ensure that the package contains the following items:

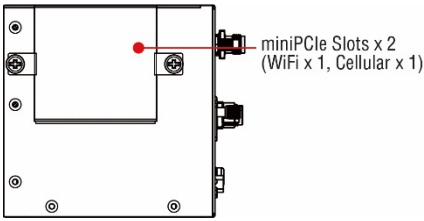
- UC-8540 Series computer
- Mounting kits
- CBL-4PINDB9F-100: 4-pin pin header to DB9 female console port cable, 100 cm
- Quick installation guide (printed)
- Warranty card

Appearance

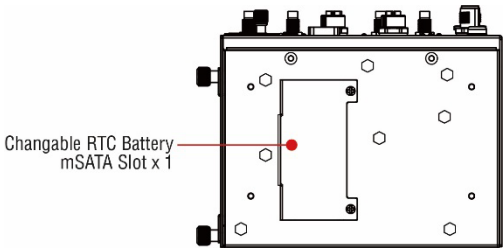
Front View



Side View



Bottom View



LED Indicators

Refer to the following table for the LED indicator definitions.

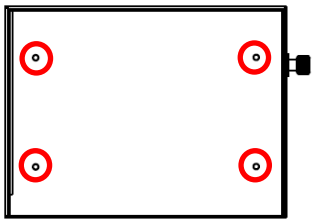
LED Name	Status	Function
P	Green	Power is on
	Off	No power input
R	Green	System is ready
	Off	System is booting up, OS boot-up failure, or other system initialization error
Ethernet (located next to the Ethernet ports)	Green	Steady On: 100 Mbps Ethernet link Blinking: Data transmission is in progress
	Yellow	Steady On: 1000 Mbps Ethernet link Blinking: Data transmission is in progress
	Off	Data transmission speed at 10 Mbps or the data cable is not connected
Serial	Green	Tx: Data transmission is in progress
	Yellow	Rx: Receiving data
	Off	No operation on the serial ports
S	Green	Data is being accessed from either the eMMC or the mSATA module
	Off	No data is being accessed
PGM	Red	Programmable LED for user-defined function
Wireless	Green	The number of glowing LEDs indicate the wireless signal strength as follows: 3 Green: Excellent 2 Green: Good 1 Green: Poor
	Off	No wireless signal

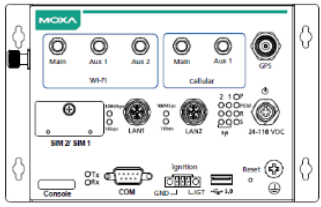
Installing the Computer

Wall or Desk Mounting

After attaching the mounting kit to the computer, use two screws per side to mount the UC-8540 computer on to a wall or desk.

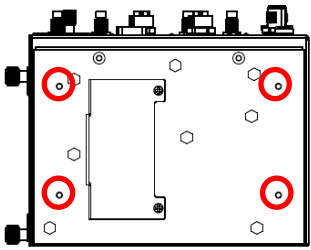
Wall Mounting

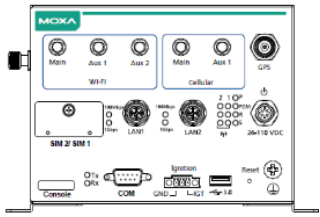




Fasten 4 M3 screws(included in the package) on the back side of the UC-8540 to attach the mounting kit.

Desk Mounting





Fasten 4 M3 screws (included in the package) on the bottom side of UC-8540 to attach the mounting kit.

Wiring Requirements

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 together with power wiring in the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.

- 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.
- It is advisable to label the wiring to all devices in the system.

ATTENTION

Safety First!

Be sure to disconnect the power cord before installing and/or wiring your UC-8540 computer.

Wiring Caution!

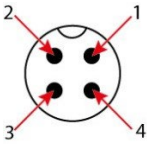
Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size. If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

Temperature Caution!

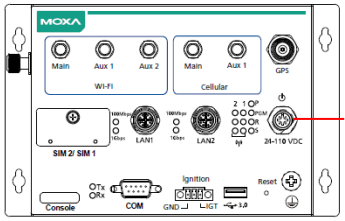
Be careful when handling the unit. When the unit is plugged in, the internal components generate heat, and consequently the outer casing may feel hot to the touch.

Connecting the Power

Connect the 24 to 110 VDC power line with M12 A-coded connector to the UC-8540 computer. If the power is supplied properly, the "P" LED will glow a solid green after a 25 to 30-second delay. The power input location and pin definition are shown in the following figures:



PIN	Definition
1	V+
2	N.C.
3	V-
4	N.C.

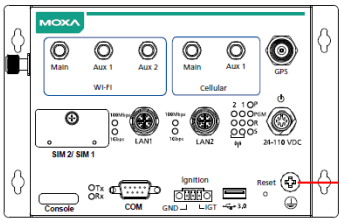


Power Input
(24-110 VDC, M12)

Grounding the Unit

Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the ground screw to the grounding surface prior to connecting the power.

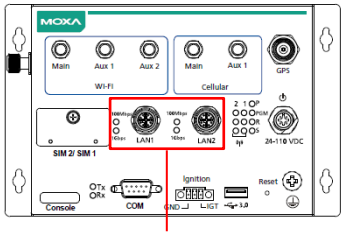
NOTE This product is intended to be mounted on a well-grounded mounting surface, such as a metal panel. The grounding connected is provided and located on the front panel. Connect the grounding wire to an appropriate grounded metal surface.



Connecting to the Network

The pin assignments for the UC-8540 computer's Ethernet port are shown in the following figure. If you are using your own Ethernet cable, make sure that you match the pin assignment on the connector of the Ethernet cable to the pin assignment shown below:

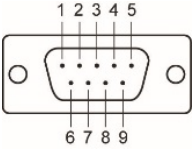
PIN	Definition
1	DA+
2	DA-
3	DB+
4	DB-
5	DD+
6	DD-
7	DC-
8	DC+

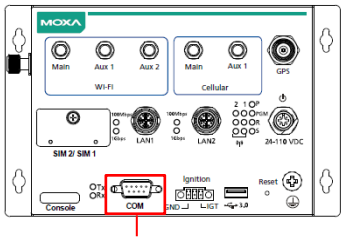


LAN Ports x 2, LEDs x 4
(10/100/1000 Mbps, M12)

Connecting a Serial Device

Use a serial cable to connect your serial device to the computer's serial port. Serial ports use DB9 connector and can be configured for RS-232, RS-422, or RS-485 communication. The pin location and assignment are shown in the following diagrams:



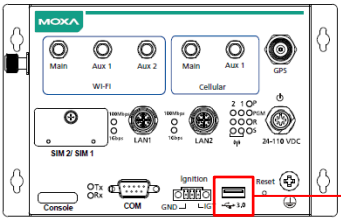


Serial Ports
(RS-232/422/485, DB9)

Pin	RS-232	RS-422	RS-485 (4-wire)	RS-485 (2-wire)
1	DCD	TxDA(-)	TxDA(-)	–
2	RxD	TxDB(+)	TxDB(+)	–
3	TxD	RxDB(+)	RxDB(+)	DataB(+)
4	DTR	RxDA(-)	RxDA(-)	DataA(-)
5	GND	GND	GND	GND
6	DSR	–	–	–
7	RTS	–	–	–
8	CTS	–	–	–

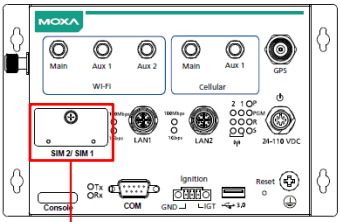
Connecting a USB Device

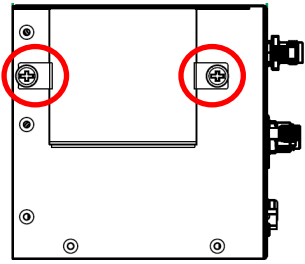
The UC-8540 computer is provided with a USB 3.0 port on the front panel for connecting a USB device.

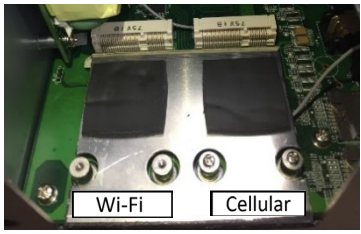


Installing the Wi-Fi/Cellular Module and Connecting the Antenna

The UC-8540 computer is provided with two sets of QMA antenna connector holes for installing antennas for the Wi-Fi and cellular modules. Unfasten the two screws on the side panel and lift up the panel to check the location of the Wi-Fi and cellular module sockets.







Socket Name	Usage
Cellular	Cellular module
Wi-Fi	Wi-Fi module

You will need to install the SIM cards for the cellular modules in the designated SIM-card slots 1 and 2.

Installing the Cellular Module

To install the cellular module, do the following:

1. Remove the plastic protective film on the thermal pads attached to the designated socket.

2. Insert the cellular module into the socket and tighten the two M2 screws on the module.

3. Attach the flat end of an antenna cable to the connector marked MAIN on the module and insert the other end of the cable into the antenna connector hole marked MAIN on the front panel of the computer.
Note: You must first remove the black cover on the antenna connector hole and insert the connector tube via the back side of the front panel.

For the AUX antenna cable, use the procedure described above and remember to insert the cable into the antenna connector hole marked AUX 1 on the front panel.

4. Use the black tape provided in the package to secure the antenna cables to the module. Attach tags (also provided in the package) to the cables as shown in the picture below to easily identify them.

5. Secure the antenna connectors to the front panel by inserting the locking washers through the connector tube followed by the nut and then tightening the nut onto the threaded protection ring.

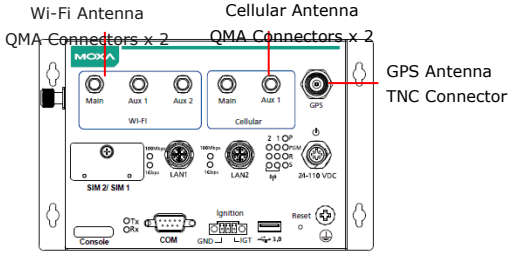
SMA Model QMA Model

NOTE If your UC-8540 is not a standalone GPS version, you can attach the GPS antenna cable to the connector marked GPS on the module.

6. Connect the antennas to the connectors on the front panel. Refer to the following illustration for the specific location of each antenna connector for the wireless modules.

7. Install external antennas using the connectors on the front panel.

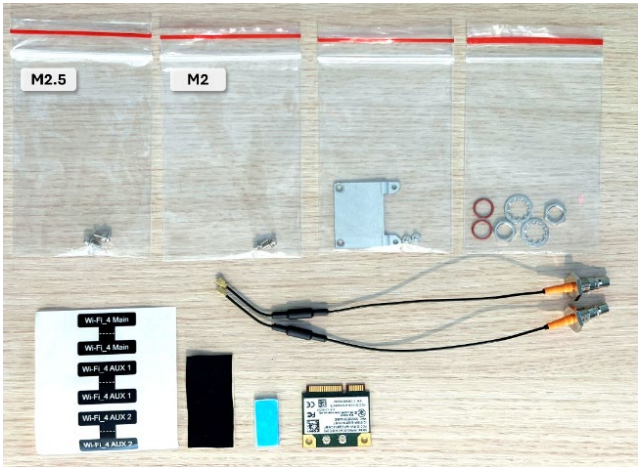
Use the procedure described above to install other Wi-Fi or cellular modules. Refer to the following figure for the specific location of each antenna connector, including the connector for a GPS antenna.



NOTE The GPS antenna connector is installed and secured by default. The connector type TNC is used in UC-8540's QMA model.

Installing the Wi-Fi Module

The Wi-Fi module package includes 1 Wi-Fi module, 1 bracket and 2 screws in a bag to extend the Wi-Fi module, 2 antenna cables and connectors, 2 locking washers, 2 nuts, 4 screws (2 M.2 and 2 M2.5; use the M.2 for the UC-8540 Series), 1 thermal pad, 1 black tape, and 1 tag sheet.



Accessories for the QMA Model

To install the Wi-Fi module, do the following:

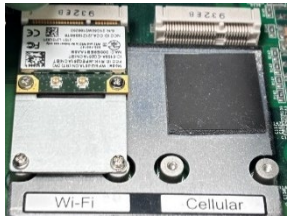
NOTE The images in the instructions show a QMA model

1. Remove the plastic protective film on the thermal pad attached to the designated socket.
2. Attach the bracket to the Wi-Fi module by tightening 2 screws as show in the image.

Front Back

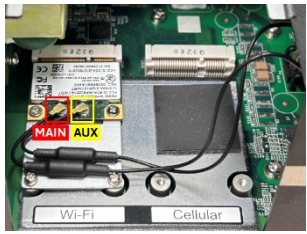
3. Insert the Wi-Fi module in the socket and use 2 M2 screws to secure the module to the socket.

   Note: The front side of the module should face upwards as shown in the image.

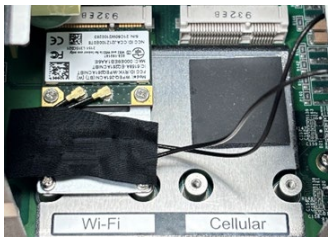


4. Attach the flat end of an antenna cable to the connector marked MAIN and insert the other end of the cable from the inside out into the antenna connector hole marked MAIN on the front panel of the computer using the antenna connector.
   Note: Before connecting the antenna cable to the antenna connector on the front panel:
   1. Remove the black cover on the antenna connector hole.
   2. Insert the orange silicon rubber through the connector tube and then insert the connector tube with the rubber into the antenna connector hole through the back side of the front panel.

   For the AUX antenna cable, use the procedure described above and remember to insert the cable into the antenna connector hole marked AUX 1 on the front panel.



5. Use the black tape provided in the package to secure the antenna cables to the module. If needed, you can also attach tags to the cable for easy identification.

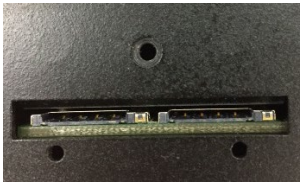


6. Secure the antenna connectors to the front panel by inserting a locking washer through connector tube and then tightening a nut onto it

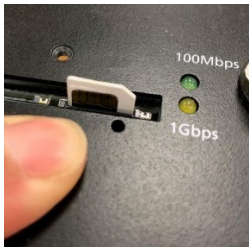
Installing SIM Cards

The cellular module supports 2 Micro SIM cards. To install Micro SIM cards for the cellular modules, do the following:

1. Open the case of the Micro SIM card socket.



2. Push down the Micro SIM-card into the socket in the correct direction.

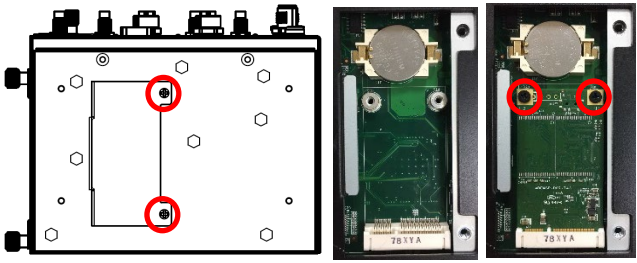


To remove the SIM card, push it in and release it.

Installing the mSATA Module & Replacing the RTC Battery

The UC-8540 computer is provided with one storage socket for installing a mSATA module and a replaceable RTC battery. To install the mSATA module, do the following:

1. Unfasten the case of bottom side to locate mSATA socket.
2. Insert the mSATA module onto the socket and fasten the two screws on the module to secure the module.



If you need to replace the RTC battery (BR2032), the battery socket is located beside the mSATA socket.