

*Arm Cortex-A7 dual-core 1 GHz train-to-ground computers with 2 Mini PCIe expansion slots for wireless modules*



## Features and Benefits

- Supports 1 WWAN connection with 2 SIM card slots
- Supports 1 WLAN (IEEE 802.11 a/b/g/n/ac) connection
- Single-panel I/O design for reduced installation space and easier maintenance
- Front-side access panel for easy maintenance
- Isolated 24 to 110 VDC power input with power-ignition function suitable for vehicle applications
- EN 50155 Tx (-40 to 70°C) operating temperature for harsh environments
- Complies with all EN 50155 mandatory test items<sup>1</sup>
- 5-year warranty

## Certifications



**EN 50121-4**



**EN 50155**



## Introduction

Moxa's UC-8540 is an innovative computing platform designed specifically for transportation applications. Its single-sided I/O design is ideal for vehicle applications, which typically do not have enough room for installing communication devices. Front-side access makes it easy to install or change SIM cards and wiring cables. Users can install or change wireless modules, mSATA cards, and the RTC battery from the top or the bottom for easy maintenance.

The UC-8540 has 1 miniPCIe slot with USB signal to support a 4G/LTE module, and 1 slot with PCIe/USB signal to support a Wi-Fi module. The 4G/LTE module has two SIM card slots, which can be used to enable redundant cellular network communications or geo-fencing SIM card selection by leveraging the built-in MIRF 2.0, a Moxa device remote-management platform with wireless management.

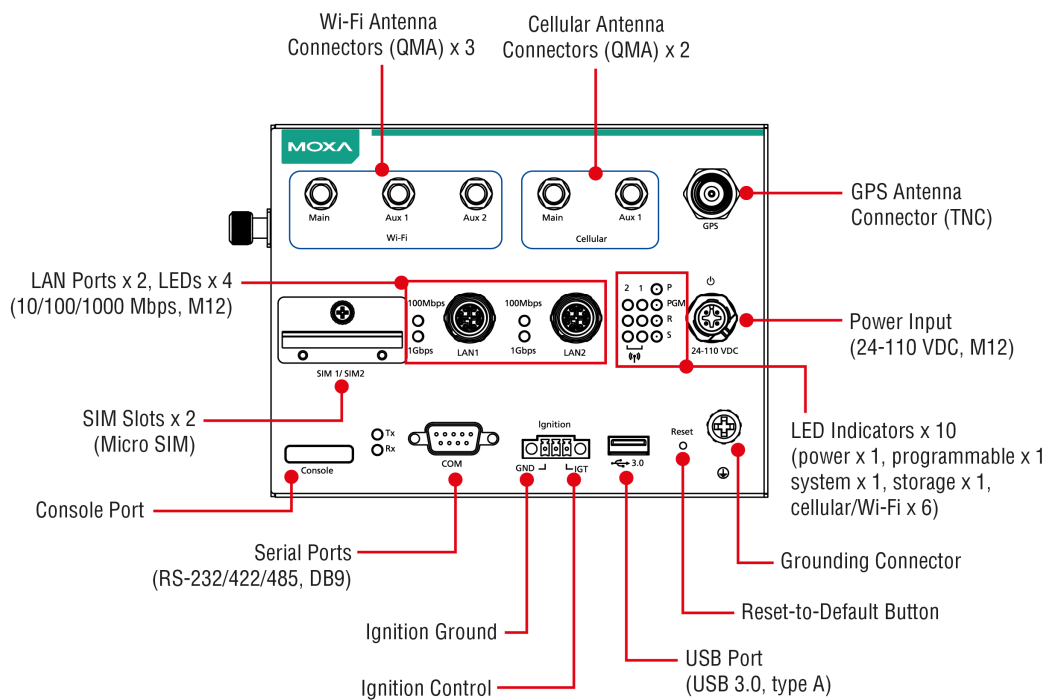
The UC-8540 can be used as a communication-centric computing platform in applications such as vehicle-to-ground communication gateway, TCMS T2G (train-to-ground) gateway, mobile condition monitoring unit, Ethernet Consist Network T2G gateway, and onboard wireless automated fare collection unit.<sup>2</sup>

The UC-8540 uses an open platform based on Debian 8 with Linux kernel 4.1, allowing solution providers to manage software packages via Debian's APT (advanced packaging tools), or develop software applications with Moxa's API Library and GNU C Library.

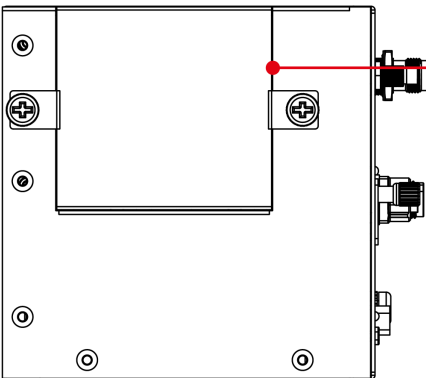
1. This product is suitable for rolling stock railway applications, as defined by the EN 50155 standard. For a more detailed statement, click here: [www.moxa.com/doc/specs/EN\\_50155\\_Compliance.pdf](http://www.moxa.com/doc/specs/EN_50155_Compliance.pdf)  
2. Wireless modules are sold separately. Please contact a Moxa sales representative for details.

Appearance

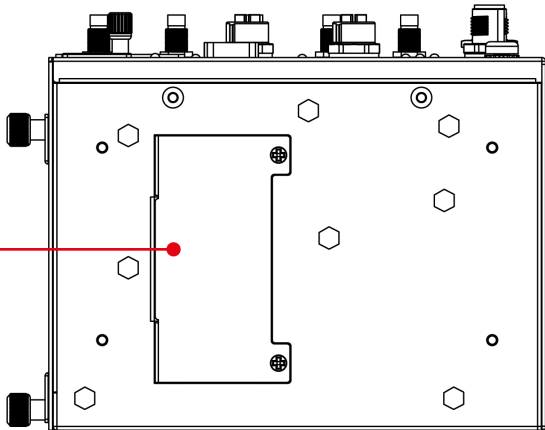
Front View



Side View



Bottom View



Specifications

Computer	
CPU	Armv7 Cortex-A7 dual-core 1 GHz
Storage Pre-installed	8 GB eMMC
Supported OS	Linux Debian 8 (Linux kernel v4.1)
System Memory Pre-installed	1 GB DDR3L
Storage Slot	mSATA slots x 1, internal mini-PCIe socket
Computer Interface	
TPM	TPM v2.0 (HW V1.1.0 and later)
Expansion Slots	mPCIe slots x 2

Ethernet Ports	Auto-sensing 10/100/1000 Mbps ports (M12 X-coded) x 2
Cellular Antenna Connector	QMA x 2
USB 3.0	USB 3.0 hosts x 1, type-A connectors
Wi-Fi Antenna Connector	QMA x 3
Serial Ports	RS-232/422/485 ports x 1, software selectable (DB9 male)
Number of SIMs	2
Console Port	RS-232 (TxD, RxD, GND), 4-pin header output (115200, n, 8, 1)
GPS Antenna Connector	TNC x 1
SIM Format	Micro

#### Input/Output Interface

Buttons	Reset button
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#### LED Indicators

System	Power x 1 System Ready x 1 Programmable x 1
LAN	2 per port (10/100/1000 Mbps)
Serial	2 per port (Tx, Rx)
Wireless Signal Strength	Cellular/Wi-Fi x 6

#### Serial Signals

RS-232	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422	Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w	Data+, Data-, GND
RS-485-4w	Tx+, Tx-, Rx+, Rx-, GND

#### GPS Interface

Heading Accuracy	0.3 degrees
Industrial Protocols	NMEA 0183, version 4.0 (V2.3 or V4.1 configurable), UBX, RTCM
Receiver Types	72-channel u-blox M8 engine
Time Pulse	0.25 Hz to 10 MHz
Velocity Accuracy	0.05 ms

#### Power Parameters

Input Current	1.66 A @ 24 VDC, 0.36 A @ 110 VDC
Input Voltage	24 to 110 VDC
Power Connector	M12 A-coded 4-pin male connector
Power Consumption	40 W (max.)

## Physical Characteristics

Protection	UC-8540-T-CT-LX: PCB conformal coating
Dimensions (with ears)	190 x 120 x 125 mm (7.46 x 4.72 x 4.92 in)
Dimensions (without ears)	160 x 120 x 120 mm (6.30 x 4.72 x 4.72 in)
Housing	Metal
Installation	Wall mounting
IP Rating	IP40
Weight	Product only: 1,600 g (3.53 lb)

## Environmental Limits

Ambient Relative Humidity	5 to 95% (non-condensing)
Operating Temperature	Standard Models: -25 to 55°C (-13 to 131°F) Wide Temp. Models: -40 to 70°C (-40 to 158°F)
Storage Temperature (package included)	-40 to 85°C (-40 to 185°F)

## Standards and Certifications

EMC	EN 55032/35
EMI	CISPR 32, FCC Part 15B Class A
EMS	IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF
Railway	EN 50121-4 EN 50155
Railway Fire Protection	EN 45545-2
Safety	EN 62368-1 IEC 62368-1
Shock	IEC 60068-2-27, IEC 61373, EN 50155
Vibration	IEC 60068-2-64, IEC 61373, EN 50155

## Declaration

Green Product	RoHS, CRoHS, WEEE
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## Warranty

Warranty Period	5 years
Details	See <a href="http://www.moxa.com/warranty">www.moxa.com/warranty</a>

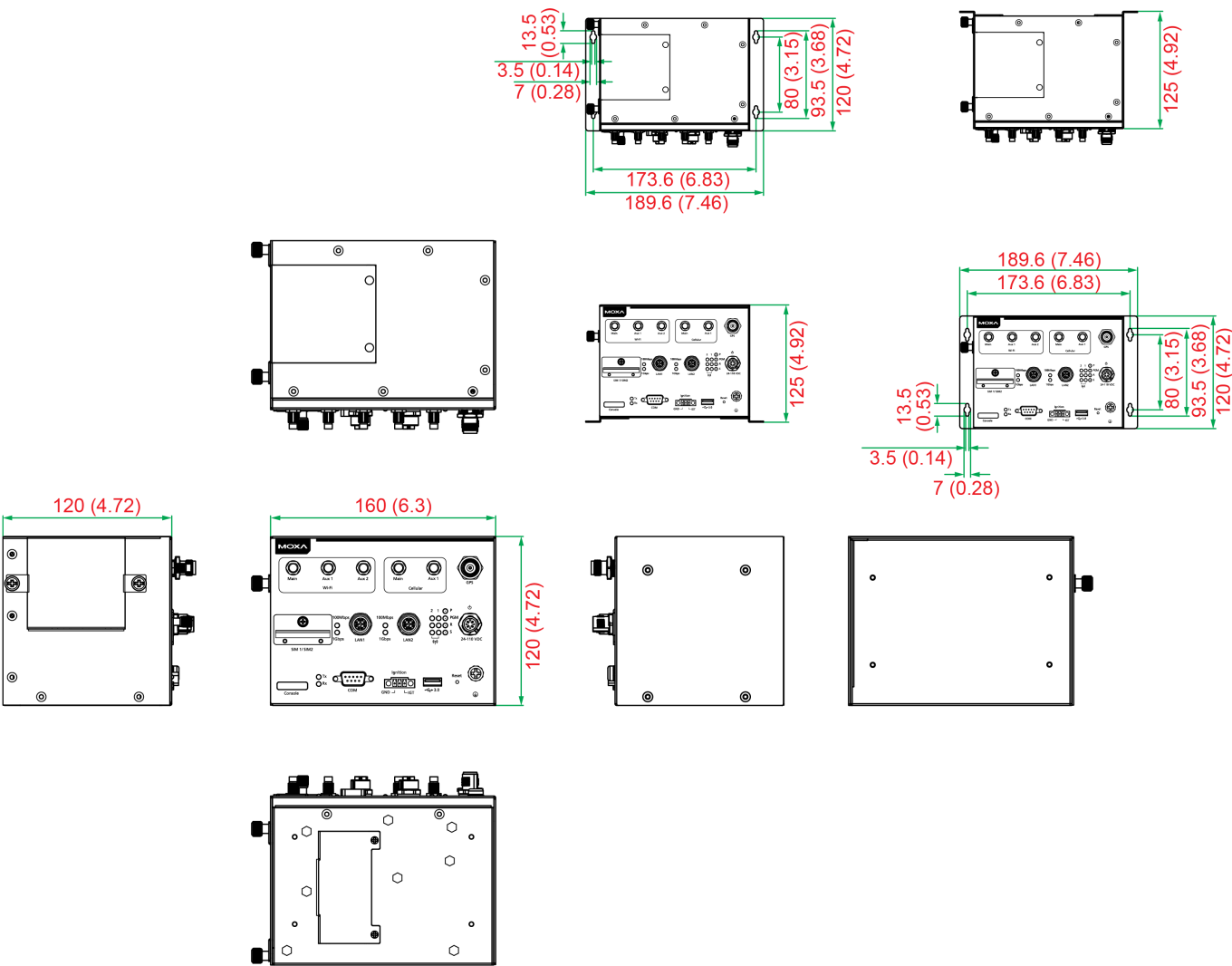
## Package Contents

Device	1 x UC-8540 Series computer
Documentation	1 x quick installation guide 1 x warranty card
Cable	1 x 4-pin header to DB9 console cable

Dimensions

Unit: mm (inch)

Mounting Type



Ordering Information

Model Name	CPU	Antenna Connector Type	Operating Temp.	Conformal Coating
UC-8540-LX	Armv7 Cortex-A7 dual-core 1 GHz	QMA	-25 to 55°C	–
UC-8540-T-LX	Armv7 Cortex-A7 dual-core 1 GHz	QMA	-40 to 70°C	–
UC-8540-T-CT-LX	Armv7 Cortex-A7 dual-core 1 GHz	QMA	-40 to 70°C	✓

Accessories (sold separately)

Wi-Fi Wireless Modules

UC-8500-WLAN33-Q-AC	3 transmitter 3 receiver Wi-Fi card module, 3 QMA connectors with cables
UC-8500-WLAN33-Q-AC-TELEC	2 transmitter 2 receiver Wi-Fi card module with TELEC certification, 2 QMA connectors with cables

Cellular Wireless Modules

UC-8500-4GCat6-Q-NAMEU	LTE Cat. 6 module for North America and Europe, 2 QMA connectors with cables, -40 to 60°C operating temperature
UC-8500-4GCat6-Q-APAC	LTE Cat. 6 module for North America and Europe, 2 QMA connectors with cables, -40 to 60°C operating temperature

Cables

CBL-F9DPF1x4-BK-100	Console cable with 4-pin connector, 1 m
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#### Power Adapters

PWR-24250-DT-S1	Power adapter, 90 to 264 VAC, 24 VDC, 2.5 A DC load
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#### Power Cords

PWC-C13AU-3B-183	Power cord with Australian (AU) plug, 1.83 m
PWC-C13CN-3B-183	Power cord with three-prong China (CN) plug, 1.83 m
PWC-C13EU-3B-183	Power cord with Continental Europe (EU) plug, 1.83 m
PWC-C13UK-3B-183	Power cord with United Kingdom (UK) plug, 1.83 m
PWC-C13JP-3B-183	Power cord with Japan (JP) plug, 7A/125V, 1.83 m
PWC-C13US-3B-183	Power cord with United States (US) plug, 1.83 m

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