MOXA UC-8540 Series Arm Cortex A7 Dual-Core 1 Ghz Train To Ground Computers Owner's Manual

Contents

MOXA UC-8540 Series Arm Cortex A7 Dual-Core 1 Ghz Train To Ground Computers

Product Information:

The UC-8540 Series is a train-to-ground computer designed for rolling stock railway applications. It is equipped with an Arm Cortex-A7 dual-core 1 GHz CPU and has 8 GB eMMC storage. The computer supports Linux Debian 8 operating system with Linux kernel
v4.1. It comes with 1 GB DDR3L system memory and a pre-installed mSATA slot for additional storage. The UC-8540 Series features 2 mini PCIe expansion slots for wireless modules.

The computer has a range of interfaces including auto-sensing 10/100/1000 Mbps Ethernet ports, USB 3.0 hosts, RS-232/422/485 serial ports, and a console port. It also provides cellular antenna connectors, Wi-Fi antenna connectors, and GPS antenna connectors. The UC-8540 Series supports various industrial protocols and has LED indicators for system, LAN, serial, wireless signal strength, and power.

In terms of physical characteristics, the UC-8540 Series has a compact size of 190 x 120 x 125 mm (with ears) or 160 x 120 x 120 mm (without ears). It is housed in a metal enclosure with IP40 rating for protection against dust. The computer can be wall-mounted and weighs approximately 1,600 g (3.53 lb). It operates within a wide range of environmental limits, including an ambient relative humidity and operating temperature suitable for railway applications.

Product Usage Instructions

1. Before using the UC-8540 Series train-to-ground computer, ensure that it is installed in a suitable location according to the provided installation instructions.
2. To power on the computer, connect it to a power source using the M12 A-coded 4-pin male power connector.
3. Connect the necessary peripherals to the computer, such as Ethernet cables, USB devices, and serial devices. Use the provided cables and connectors for the respective interfaces.
4. If you wish to expand the functionality of the computer with wireless modules, insert them into the available mini PCIe expansion slots. Ensure that the modules are securely inserted.
5. To establish network connectivity, connect Ethernet cables to the auto-sensing 10/100/1000 Mbps Ethernet ports. These ports use M12 X-coded connectors.
6. If you need to connect external antennas for cellular or Wi-Fi communication, use the provided QMA

connectors. Ensure that the antennas are properly connected.

7. For serial communication, use the RS-232/422/485 ports. These ports are software selectable and can be configured using the provided DB9 male connector.
8. If you need to access the computer's console, use the provided 4-pin header to DB9 console cable. Connect it to the console port and a compatible device for console access.
9. The UC-8540 Series features LED indicators for various system statuses. Refer to the user manual for detailed information on the meaning of each LED indicator.
10. Refer to the user manual for further instructions on configuring and using the UC-8540 Series train-to-ground computer for specific applications and requirements.

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 802.11b/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 items1
- 5-year warranty

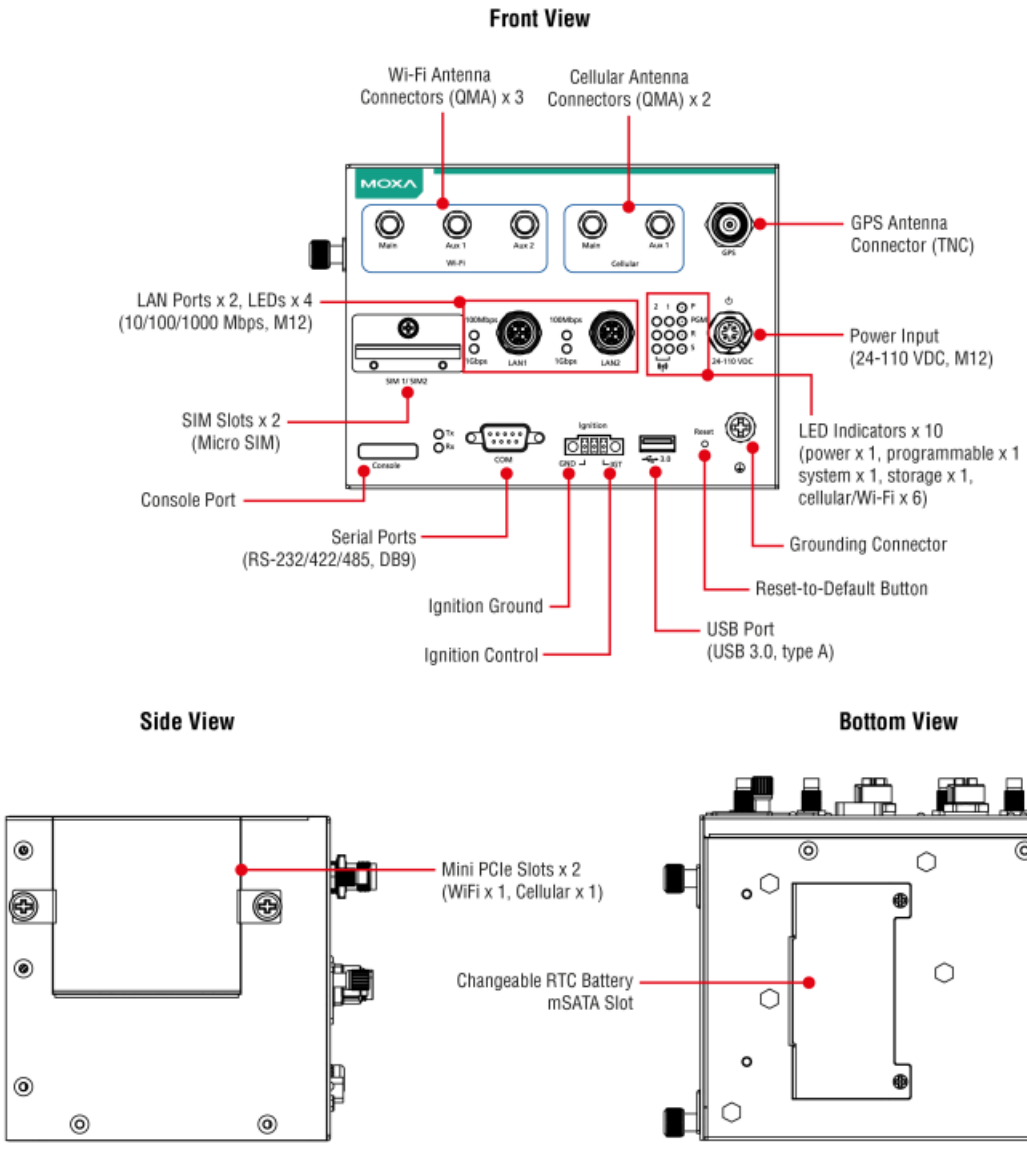
Certifications

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.2 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
2. Wireless modules are sold separately. Please contact a Moxa sales representative for details.

Appearance



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

Expansion Slots	mPCIe slot 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

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: -4 0 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

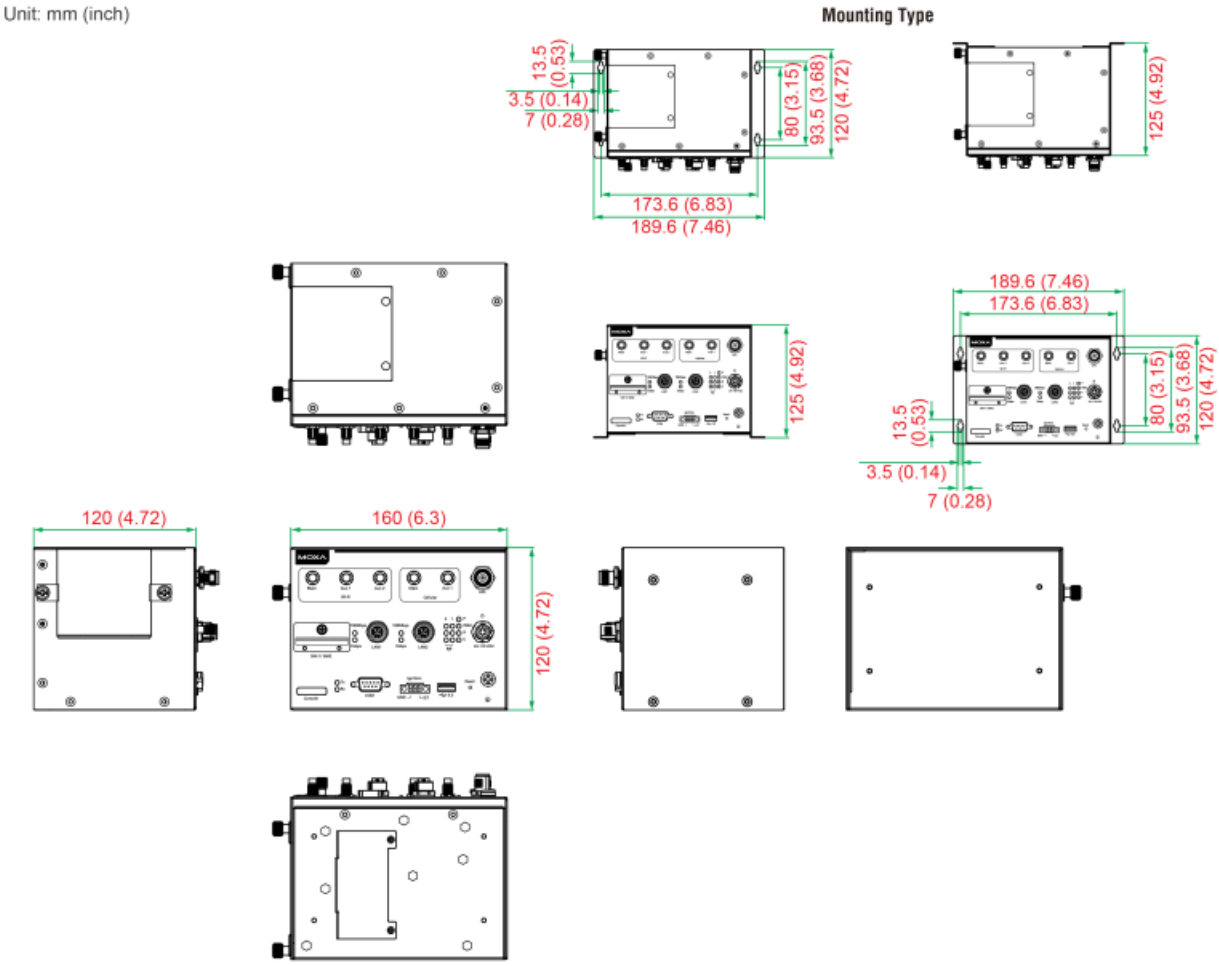
Warranty

Warranty Period	5 years
Details	See www.moxa.com/warranty

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



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

Power Adapters

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

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

www.moxa.com

Documents / Resources

	MOXA UC-8540 Series Arm Cortex A7 Dual-Core 1 Ghz Train To Ground Computers [pdf] Owner's Manual UC-8540 Series Arm Cortex A7 Dual-Core 1 Ghz Train To Ground Computers, UC-8540 Series, Arm Cortex A7 Dual-Core 1 Ghz Train To Ground Computers, 1 Ghz Train To Ground Computers, To Ground Computers, Ground Computers, Computers
	MOXA UC-8540 Series Arm Cortex A7 Dual Core 1 Ghz Train To Ground Computers [pdf] Installation Guide UC-8540 Series Arm Cortex A7 Dual Core 1 Ghz Train To Ground Computers, UC-8540 Series, Arm Cortex A7 Dual Core 1 Ghz Train To Ground Computers, Train To Ground Computers, Ground Computers

References

- ™ Moxa - Your Trusted Partner in Automation
- ™ Moxa - Your Trusted Partner in Automation
- ™ Warranty Policy