UC-8580 Series

Arm Cortex-A7 dual-core 1 GHz train-to-ground computer with 4 mini PCIe expansion slots for wireless modules

Features and Benefits

- Complies with all EN 50155 mandatory test items[1]
- Supports up to 3 WWAN connections and 2 SIM card slots per cellular module
- 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
- 5-year warranty

Certifications

EN 50155   EN 50121-4   c UL us LISTED   CE

Introduction

Moxa's UC-8580 is an innovative computing platform designed specifically for transportation applications.

The UC-8580 is available with one of two different types of antenna connectors. The SMA model supports all SMA type connectors. The QMA model supports TNC connectors for GPS and QMA connectors for Wi-Fi/cellular modules, and has four slots for installing wireless modules.[2] Three slots support 4G LTE modules, and one slot supports a Wi-Fi module. Each 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 Wireless Manager, a Moxa software utility for cellular and Wi-Fi management.

The UC-8580 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.
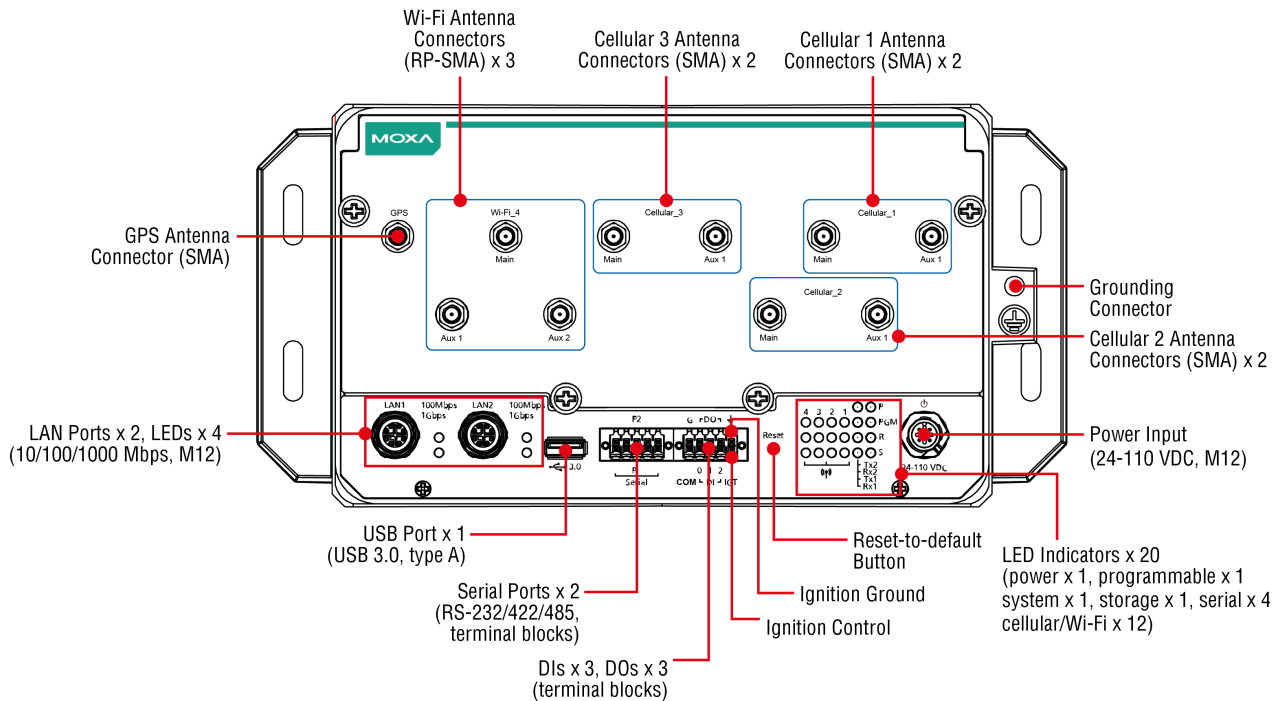
The UC-8580's single-sided I/O design is ideal for vehicle applications, which typically do not have a lot of room for installing communications devices. The UC-8580 also has an access panel on the front side, allowing users to install or change wireless modules, SIM cards, or mSATA cards without removing the entire unit from the wall after being mounted.

The UC-8580 can be used as a communication-centric computing platform for the following applications:
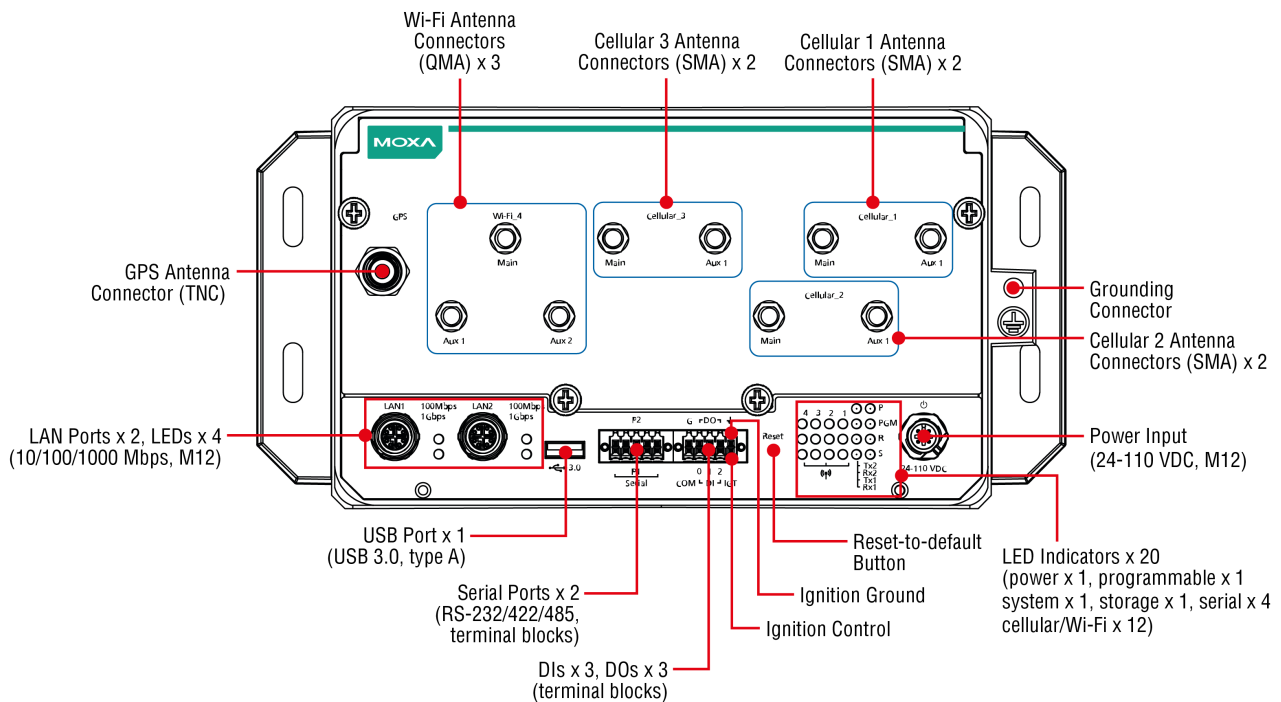
- Vehicle-to-ground communication gateway
- TCMS T2G (train-to-ground) gateway
- Mobile condition monitoring unit
- Ethernet Consist Network T2G gateway
- Onboard wireless automated fare collection unit

Appearance

SMA Model

- Wi-Fi Antenna Connectors (RP-SMA) x 3
- Cellular 3 Antenna Connectors (SMA) x 2
- Cellular 1 Antenna Connectors (SMA) x 2
- GPS Antenna Connector (SMA)
- Grounding Connector
- Cellular 2 Antenna Connectors (SMA) x 2
- LAN Ports x 2, LEDs x 4 (10/100/1000 Mbps, M12)
- Power Input (24-110 VDC, M12)
- USB Port x 1 (USB 3.0, type A)
- Reset-to-default Button
- Serial Ports x 2 (RS-232/422/485, terminal blocks)
- Ignition Ground
- Ignition Control
- LED Indicators x 20 (power x 1, programmable x 1 system x 1, storage x 1, serial x 4 cellular/Wi-Fi x 12)
- DIs x 3, DOs x 3 (terminal blocks)

QMA Model

- Wi-Fi Antenna Connectors (QMA) x 3
- Cellular 3 Antenna Connectors (SMA) x 2
- Cellular 1 Antenna Connectors (SMA) x 2
- GPS Antenna Connector (TNC)
- Grounding Connector
- Cellular 2 Antenna Connectors (SMA) x 2
- LAN Ports x 2, LEDs x 4 (10/100/1000 Mbps, M12)
- Power Input (24-110 VDC, M12)
- USB Port x 1 (USB 3.0, type A)
- Reset-to-default Button
- Serial Ports x 2 (RS-232/422/485, terminal blocks)
- Ignition Ground
- Ignition Control
- LED Indicators x 20 (power x 1, programmable x 1 system x 1, storage x 1, serial x 4 cellular/Wi-Fi x 12)
- DIs x 3, DOs x 3 (terminal blocks)

Specifications

Computer

CPU	Armv7 Cortex-A7 dual-core 1 GHz
System Memory Pre-installed	1 GB DDR3L
Supported OS	Linux Debian 8 (Linux kernel v4.1)

Datasheet

Storage Slot	mSATA slots x 1, internal mini-PCIe socket
Storage Pre-installed	4 GB eMMC

Computer Interface

Ethernet Ports	Auto-sensing 10/100/1000 Mbps ports (M12 X-coded) x 2
Serial Ports	RS-232/422/485 ports x 2, software-selectable (terminal block)
USB 3.0	USB 3.0 hosts x 1, type-A connectors
Digital Input	DIs x 3
Digital Output	DOs x 3
Expansion Slots	mPCIe slot x 4
Wi-Fi Antenna Connector	UC-8580-LX/8580-T-LX/8580-T-CT-LX: RP-SMA x 3 UC-8580-Q-LX/8580-T-Q-LX/8580-T-CT-Q-LX: QMA x 3
Cellular Antenna Connector	UC-8580-LX/8580-T-LX/8580-T-CT-LX: SMA x 6 UC-8580-Q-LX/8580-T-Q-LX/8580-T-CT-Q-LX: QMA x 6
Number of SIMs	6
SIM Format	Mini
GPS Antenna Connector	UC-8580-LX/8580-T-LX/8580-T-CT-LX: SMA x 1 UC-8580-Q-LX/8580-T-Q-LX/8580-T-CT-Q-LX: TNC x 1
Console Port	RS-232 (TxD, RxD, GND), 4-pin header output (115200, n, 8, 1)

Input/Output Interface

Buttons	Reset button

Digital Inputs

Channel-to-Channel Isolation	3K VDC
Connector	Screw-fastened Euroblock terminal
Counter Frequency	25 Hz
Dry Contact	On: short to GND Off: open
I/O Mode	DI
Points per COM	3 x channel
Sensor Type	Wet Contact (NPN or PNP)
Wet Contact (DI to COM)	On: 10 to 30 VDC Off: 0 to 3 VDC

Digital Outputs

Connector	Screw-fastened Euroblock terminal
Current Rating	200 mA per channel
I/O Type	Sink
Voltage	0 to 30 VDC

Datasheet

LED Indicators

System	Power x 1 System Ready x 1 Programmable x 1
Wireless Signal Strength	Cellular/Wi-Fi x 12
LAN	2 per port (10/100/1000 Mbps)
Serial	2 per port (Tx, Rx)

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

Housing	Metal
IP Rating	IP40
Dimensions (with ears)	270 x 134 x 88 mm (10.63 x 5.28 x 3.46 in)
Dimensions (without ears)	220 x 134 x 88 mm (8.66 x 5.28 x 3.46 in)
Weight	Product only: 2,200 g (4.85 lb)
Installation	Wall mounting
Protection	-CT models: PCB conformal coating

Environmental Limits

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)
Ambient Relative Humidity	5 to 95% (non-condensing)

Standards and Certifications

EMC	EN 55032/24
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 60950-1, UL 60950-1
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-8580 Series computer
Cable	1 x 4-pin header to DB9 console cable
Documentation	1 x quick installation guide 1 x warranty card

Dimensions

Unit: mm (inch)
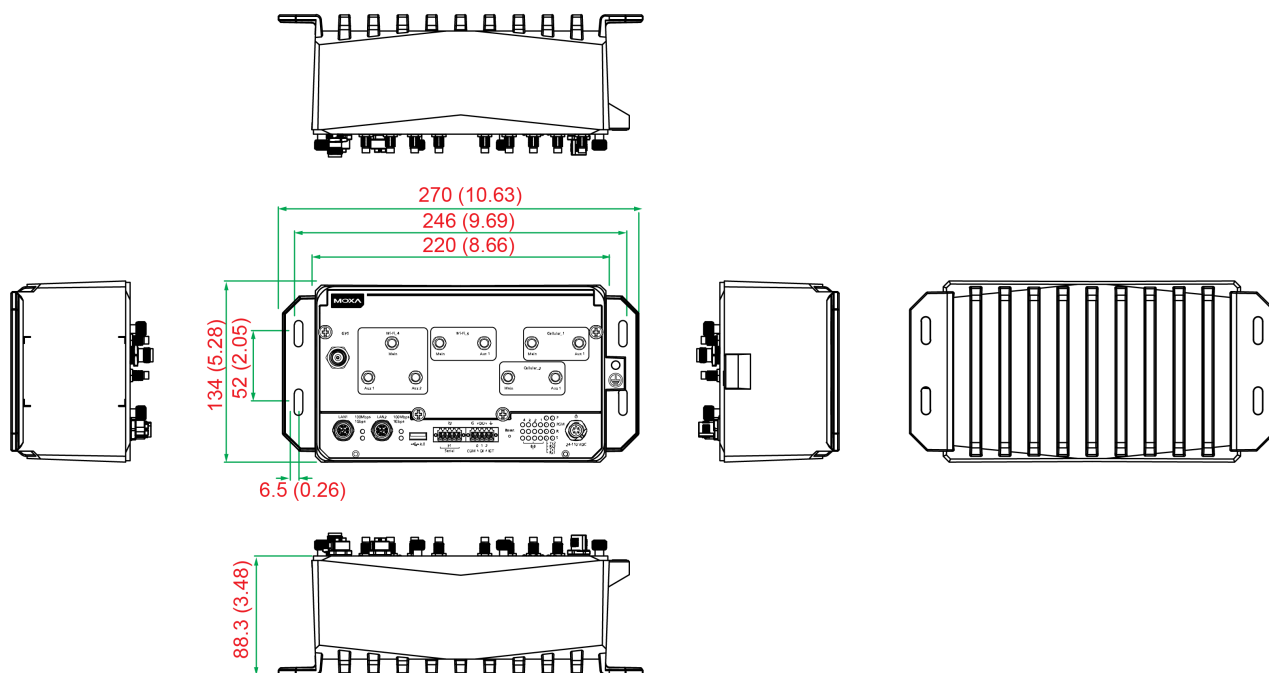
Ordering Information

Model Name	CPU	Antenna Connector Type	Operating Temp.	Conformal Coating
UC-8580-LX	Armv7 Cortex-A7 dual-core 1 GHz	SMA	-25 to 55°C	–
UC-8580-T-LX	Armv7 Cortex-A7 dual-core 1 GHz	SMA	-40 to 70°C	–
UC-8580-T-CT-LX	Armv7 Cortex-A7 dual-core 1 GHz	SMA	-40 to 70°C	✓
UC-8580-Q-LX	Armv7 Cortex-A7 dual-core 1 GHz	QMA	-25 to 55°C	–
UC-8580-T-Q-LX	Armv7 Cortex-A7 dual-core 1 GHz	QMA	-40 to 70°C	–
UC-8580-T-CT-Q-LX	Armv7 Cortex-A7 dual-core 1 GHz	QMA	-40 to 70°C	✓

Accessories (sold separately)

Cables

CBL-F9DPF1x4-BK-100	Console cable with 4-pin connector, 1 m
CBL-M12FF4POPEN-150 IP67	M12-Open power cable, 4-pin A-coded female connector, IP67, 1.5 m
CBL-M12FF4POPEN-300 IP67	M12-Open power cable, 4-pin A-coded female connector, IP67, 3 m
CBL-M12XMM8PRJ45-BK-100-IP67	M12-to-RJ45 Cat-5E UTP gigabit Ethernet cable, 8-pin X-coded male connector, IP67, 1 m
CBL-M12XMM8PRJ45-BK-200-IP67	M12-to-RJ45 Cat-5E UTP gigabit Ethernet cable, 8-pin X-coded male connector, IP67, 2 m

Power Cords

PWC-C7AU-2B-183	Power cord with Australian (AU) plug, 2.5A/250V, 1.83 m
PWC-C7CN-2B-183	Power cord with two-prong China (CN) plug, 1.83 m
PWC-C7EU-2B-183	Power cord with Continental Europe (EU) plug, 2.5A/250V, 1.83 m

PWC-C7UK-2B-183	Power cord with United Kingdom (UK) plug, 2.5A/250V, 1.83 m
PWC-C7US-2B-183	Power cord with United States (US) plug, 10A/125V, 1.83 m

Power Adapters

PWR-24270-DT-S1	Power adapter, input voltage 90 to 264 VAC, output voltage 24 V with 2.5 A DC load

Connectors

M12A-4PFF-IP67	M12 cable connector, female 4-pin, A-coded
M12A-4PMM-IP67	M12 cable connector, male 4-pin, A-coded
M12X-8PMM-IP65	M12 cable connector, male 8-pin, X-coded

Cellular Wireless Modules

UC-8580-4GCat4-CN	LTE Cat. 4 module for China, 2 SMA connectors with cable
UC-8500-4GCat4-Q-CN	LTE Cat. 4 module for China, 2 QMA connectors with cable
UC-8500-4GCat6-Q-NAMEU	LTE Cat. 6 module for North America and Europe, 2 QMA connectors with cable
UC-8580-4GCat6-NAMEU	LTE Cat. 6 module for North America and Europe, 2 SMA connectors with cable
UC-8500-4GCat6-Q-APAC	LTE Cat. 6 module for Asia Pacific, 2 QMA connectors with cable (operating temperature: -40 to 60°C)

Wi-Fi Wireless Modules

UC-8580-WLAN33-AC	Wi-Fi module, 3 SMA connectors with cable
UC-8500-WLAN33-Q-AC	Wi-Fi module, 3 QMA connectors with cable