

# UC-8100-ME-T Series

## Communication-centric RISC computing platform



- > ARMv7 Cortex-A8 1000 MHz processor
- > Dual auto-sensing 10/100 Mbps Ethernet ports
- > SD socket for storage expansion
- > Programmable LEDs and a programmable button for easy installation and maintenance
- > Mini PCIe socket for cellular module
- > Debian ARM 7 open platform
- > Cybersecurity
- > -40°C to 70°C wide temperature range with LTE enabled



### Overview

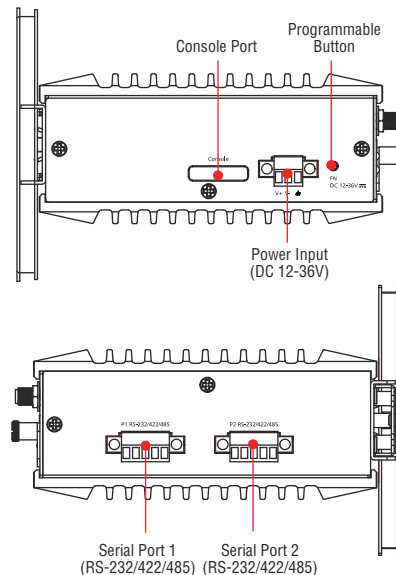
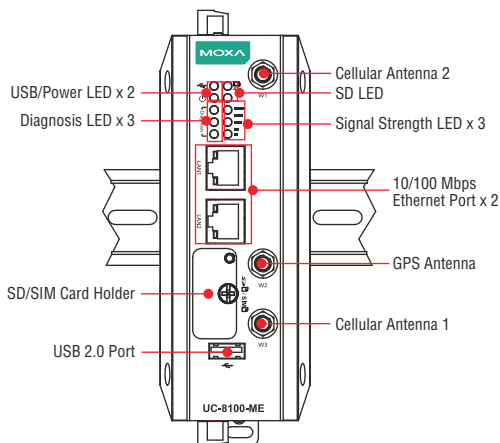
The UC-8100-ME-T computing platform is designed for embedded data acquisition applications. The computer comes with one or two RS-232/422/485 serial ports and dual 10/100 Mbps Ethernet LAN ports, as well as a Mini PCIe socket to support cellular modules. These versatile communication capabilities let users efficiently adapt the UC-8100-ME-T to a variety of complex communications solutions.

The UC-8100-ME-T is built around a Cortex-A8 RISC processor that has been optimized for use in energy monitoring systems, but is

widely applicable to a variety of industrial solutions. With flexible interfacing options, this tiny embedded computer is a reliable and secure gateway for data acquisition and processing at field sites as well as a useful communication platform for many other large-scale deployments.

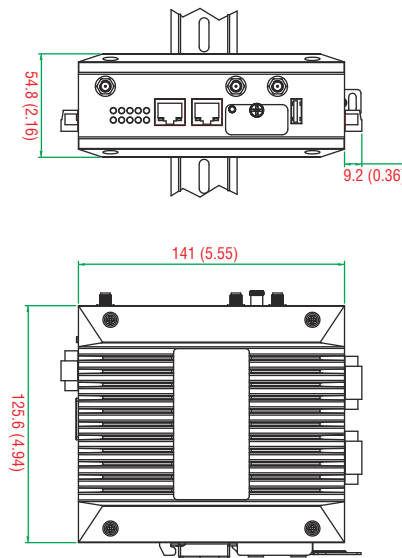
Wide temperature LTE-enabled models are available for extended temperature applications. All units are thoroughly tested in a testing chamber, guaranteeing that the LTE-enabled computing platforms are suitable for wide temperature applications.

### Appearance



## Dimensions

Unit: mm (inch)



## Hardware Specifications

### Computer

**CPU:** ARMv7 Cortex-A8 1000 MHz

**USB:** USB 2.0 host x 1 (type A connector)

### DRAM:

UC-8112-ME-T-LX: 512 MB DDR3 SDRAM

UC-8112-ME-T-LX-US: 512 MB DDR3 SDRAM

**OS (pre-installed):** Debian ARM 7 (Kernel 3.2)

### Storage

#### Storage Expansion:

- SDHC/SDXC socket for storage expansion
- 4 GB eMMC flash with OS pre-installed

### Ethernet Interface

**LAN:** 2 auto-sensing 10/100 Mbps ports (RJ45)

**Magnetic Isolation Protection:** 1.5 kV built-in

### Serial Interface

**Serial Standards:** 1 or 2 RS-232/422/485 ports, software-selectable (5-pin terminal block connector)

**Console Port:** RS-232 (TxD, RxD, GND), 4-pin pin header output (115200, n, 8, 1)

### Serial Communication Parameters

**Data Bits:** 5, 6, 7, 8

**Stop Bits:** 1, 1.5, 2

**Parity:** None, Even, Odd, Space, Mark

**Flow Control:** XON/XOFF, ADDC® (automatic data direction control) for RS-485

**Baudrate:** 921600 bps (max.)

### Serial Signals

**RS-232:** TxD, RxD, RTS, CTS, GND

**RS-422:** TxD+, TxD-, RxD+, RxD-, GND

**RS-485-4w:** TxD+, TxD-, RxD+, RxD-, GND

**RS-485-2w:** Data+, Data-, GND

### LEDs

**System:** Power x 1, USB x 1, SD x 1, signal strength x 3

**LAN:** 10M/100M on connector

**Programmable:** Diagnosis x 3

### Switches and Buttons

**Push Button:** Initially configured to return a diagnostic report, and to reset the device to factory defaults

### Physical Characteristics

**Housing:** SECC + Al 5052

**Weight:** 550 g (1.22 lb)

**Dimensions:** 141 x 119.9 x 36 mm (5.56 x 4.72 x 1.42 x in)

**Mounting:** DIN rail, wall (with optional kit)

### Environmental Limits

#### Operating Temperature:

Wide Temp. Models: -40 to 85°C (-40 to 185°F)

Wide Temp. models (with LTE accessory): -40 to 70°C (-40 to 158°F)

**Storage Temperature:** -40 to 85°C (-40 to 185°F)

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

**Anti-Vibration:** 2 Grms @ IEC 60068-2-64, random wave, 5-500 Hz, 1 hr per axis (without any USB devices attached)

**Anti-Shock:** 20 g @ IEC 60068-2-27, half sine wave, 30 ms

### Power Requirements

**Input Voltage:** 12 to 36 VDC (3-pin terminal block, V+, V-, SG)

**Input Current:** 500 mA @ 12 VDC

**Power Consumption:** 6 W (without cellular module and external USB device attached)

### Standards and Certifications

**Safety:** UL 60950-1, EN 60950-1

**EMC:** EN 55032/24

**EMI:** CISPR 32, FCC Part 15B Class A

#### EMS:

IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV

IEC 61000-4-3 RS: 80 MHz to 1 GHz, 3 V/m

IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV

IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV

IEC 61000-4-6 CS: Signal: 1 kV

IEC 61000-4-8

**Green Product:** RoHS, CRoHS, WEEE

### Reliability

**Alert Tools:** External RTC (real-time clock)

**Automatic Reboot Trigger:** External WDT (watchdog timer)

### Warranty

**Warranty Period:** 5 years

**Details:** See [www.moxa.com/warranty](http://www.moxa.com/warranty)

## Software Specifications

### Linux

**OS:** Debian ARM 7

**Web Server (Apache):** Allows you to create and manage web sites; supports PHP and XML

**Terminal Server (SSH):** Provides secure encrypted communications between two untrusted hosts over an unsecure network

**Kernel:** GNU/Linux 3.2

**System Shell:** DASH (default), BASH

**Text Editor:** vim, nano

**Internet Protocol Suite:** TCP, UDP, IPv4, IPv6, SNMPv2, ICMP, ARP, HTTP, CHAP, PAP, DHCP, NTP, NFS, SSH, PPP, SFTP, RSYNC, SSL

**Programming Language Support:** PHP, Perl, Python

**Internet Security Suite:** OpenVPN, IPTables

**Cryptographic Hardware Accelerators:** AES, SHA, OpenSSL

**Self Diagnosis:** Check status of system and hardware component via software method

**Linux Board Support Packages (BSP):**

- GCC C/C++ cross development tool chain
- Bootloader/ Kernel/ filesystem

**Cellular Networking:**

- WVDIAL: Point-to-Point Protocol dialer that dials a modem and starts pppd to connect to the Internet.
- QMI (Qualcomm MSM Interface): Glib-based library for talking to WWAN modems and devices that speak the Qualcomm MSM Interface (QMI) protocol.

- MODBUS: Software library to send/receive data according to the Modbus protocol. This library is written in C and supports RTU (serial) and TCP (Ethernet) communications.

- Watchdog: Features a hardware function to trigger system reset in a user specified time interval (Linux standard API).

**Cybersecurity:**

- Secure Boot: A novel authentication algorithm proposed to secure platform integration. Only trusted Linux kernel and bootloader should be executed (Patent Pending).

- SUDO Mechanism: Sudo (short for super-user do) is a program designed to let system administrators allow some users to execute certain commands as the root user (or another user). The root user account is disabled by default. The basic philosophy is to give as few privileges as possible but still allow people to get their work.

- Security Update of Existing Software Packages: All software packages installed on the UC-8100-ME-T can be automatically updated using Debian Linux's Advanced Packaging Tool (APT) server or Moxa's server.

- USB Protection: Provides a mechanism for disabling USB function to avoid USB stick malware attacks.

- SD Write Protection: Provides a mechanism for disabling write permission to the microSD memory card plugged in directly into the card slot, or which is part of an extended storage system.

## Ordering Information

Model	CPU	RAM	Serial	Ethernet	SD Card Slot	USB	Operating Temperature
UC-8112-ME-T-LX	1 Ghz	512 MB	2	2	1	1	-40 to 85°C
UC-8112-ME-T-LX1	1 Ghz	512 MB	2	2	1 (1 GB SD pre-installed)	1	-40 to 85°C
UC-8112-ME-T-LX-LTE-US (LTE module pre-installed)	1 Ghz	512 MB	2	2	1	1	-40 to 70°C

### Package Checklist

- UC-8100-ME-T embedded computer
- Power jack
- DIN-rail kit (pre-installed)
- Quick installation guide (printed)
- Warranty card

**Optional Accessories (can be purchased separately)**

**Power Adapters, Power Cords, Console Cables**

Model Name	Package Contents	Description
PWR-24250-DT-S1	• Power Adapter x 1	Power adapter for testing and system development indoors under ambient temperature conditions (input: 100 to 240 VAC, 50 to 60 Hz, 1.5 A; output: 24 VDC, 2.5 A, 60 W)
PWC-C7US-2B-183	• Power Cord x 1	10A/125V North American (US) power cord, 183 cm
PWC-C7EU-2B-183	• Power Cord x 1	10A/250V Continental European (EU) power cord, 183 cm
PWC-C7UK-2B-183	• Power Cord x 1	10A/250V United Kingdom (UK) power cord, 183 cm
PWC-C7AU-2B-183	• Power Cord x 1	2.5A/250V Australian (AU) power cord, 183 cm
PWC-C7CN-2B-183	• Power Cord x 1	10A/250V China (CN) power cord, 183 cm
CBL-F9DPF1x4-BK-100	• Console Cable x 1	Console cable with 4-pin connector

**Wireless Packages**

Model Name	Package Contents	Description
ME-CELLULAR-LTE-EU	<ul style="list-style-type: none"> <li>• Cellular module x 1</li> <li>• i-PEX MHF to SMA adapter with cable x 3</li> <li>• Mini PCI/e mount screw sets x 2</li> <li>• Heat sink x 1</li> </ul>	LTE regions: Asia, Europe, Australia, New Zealand (compatible with LTE/EU, HSPA+, GPRS/GSM, and GPS) LTE: B1, B3, B7, B8, B20 UMTS/HSPA+: B1, B2, B5, B6, B8 GNSS (GPS+Glonass)
ME-CELLULAR-LTE-US	<ul style="list-style-type: none"> <li>• Cellular module x 1</li> <li>• i-PEX MHF to SMA adapter with cable x 3</li> <li>• Mini PCI/e mount screw sets x 2</li> <li>• Heat sink x 1</li> </ul>	LTE regions: North America (compatible with LTE/US, HSPA, GPRS/GSM, and GPS) LTE: B2, B4, B5, B13, B17, B25 UMTS/HSPA+: B1, B2, B4, B5, B8 GNSS (GPS+Glonass)

**Antennas and Internal Antenna Cables**

Model Name	Package Contents	Description
ANT-GPS-OSM-05-3M	• GPS Antenna x 1	Active GPS antenna, 26 dBi, 1572 MHz, L1 band antenna for GPS
ANT-LTE-OSM-03-3m BK	• LTE Antenna x 1	Multi-band antenna that covers 700-2700 MHz. Specially designed for 2G, 3G, and 4G applications. Magnetic mounting is available.
ANT-LTE-ASM-04 BK	• LTE Antenna x 1	LTE Stick antenna that covers 704-960/1710-2620 MHz providing omnidirectional radiation with a gain of 4.5 dBi.
ANT-LTE-ASM-05 BK	• LTE Antenna x 1	LTE stick antenna that covers 704-960/1710-2620 MHz with a gain of 5 dBi.
ANT-LTE-OSM-06-3m BK MIMO	• LTE Antenna x 1	Multi-band antenna that covers 700-2700/2400-2500/5150-5850 MHz frequencies. Screw-fastened mounting and full IP67 waterproofing are available.

**DIN-Rail Kits**

Model Name	Package Contents	Description
UC-8100-ME DIN-Rail Kit	• DIN-rail kit x 1	DIN-rail kit with screws