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
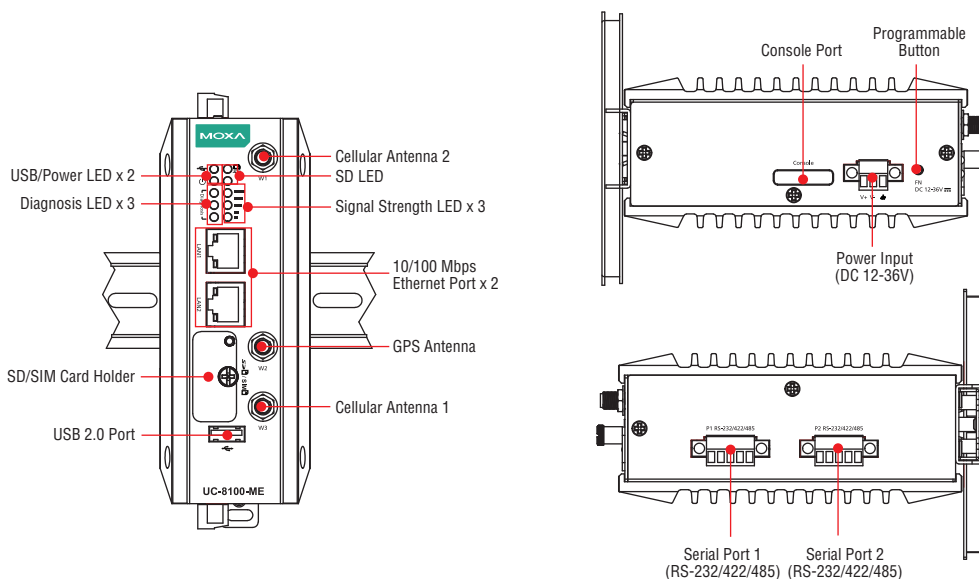
Overview

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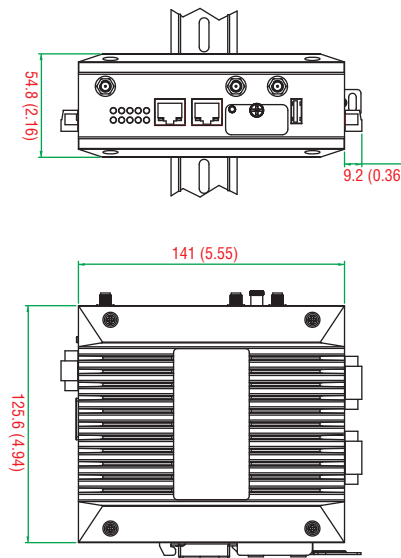
Wide temperature LTE-enabled models are available for extended temperature applications. All units are thoroughly tested in a testing chamber, guaranteeing that the LTE-enabled computing platforms are suitable for wide temperature applications.

Appearance

USB/Power LED x 2
Diagnosis LED x 3
Cellular Antenna 2
SD LED
Signal Strength LED x 3
10/100 Mbps Ethernet Port x 2
SD/SIM Card Holder
GPS Antenna
USB 2.0 Port
Cellular Antenna 1

Console Port
Programmable Button
Power Input (DC 12-36V)

Serial Port 1 (RS-232/422/485)
Serial Port 2 (RS-232/422/485)

Dimensions

Unit: mm (inch)

54.8 (2.16)

9.2 (0.36)

141 (5.55)

125.6 (4.94)

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 + AI 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 55022/24
EMI: CISPR 22, 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

: Software Specifications

Linux

OS: Debian ARM 8

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 4.0

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-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
• Quick installation guide (printed)
• Warranty card

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⁞ 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	• Cellular module x 1 • i-PEX MHF to SMA adapter with cable x 3 • Mini PCI/e mount screw sets x 2 • Heat sink x 1	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	• Cellular module x 1 • i-PEX MHF to SMA adapter with cable x 3 • Mini PCI/e mount screw sets x 2 • Heat sink x 1	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