

UC-8112-LX1

Communication-centric RISC computing platform



- > ARMv7 Cortex-A8 1000 MHz processor
- > Dual auto-sensing 10/100 Mbps Ethernet ports
- > SD socket for storage expansion and OS installation
- > Rich programmable LEDs and a programmable button for easy installation and maintenance
- > Debian ARM 8 open platform
- > Cybersecurity



Overview

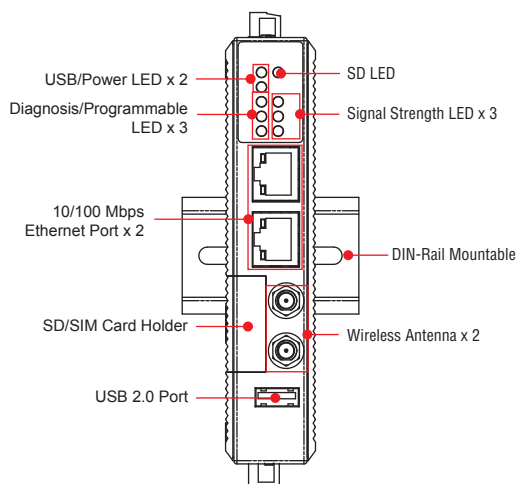
The UC-8112-LX1 computing platform is designed for embedded data acquisition applications. The computer comes with two RS-232/422/485 serial ports and dual 10/100 Mbps Ethernet LAN ports. These versatile communication capabilities let users efficiently adapt the UC-8112-LX1 to a variety of complex communications solutions.

The UC-8112-LX1 is built around a Cortex-A8 RISC processor that has

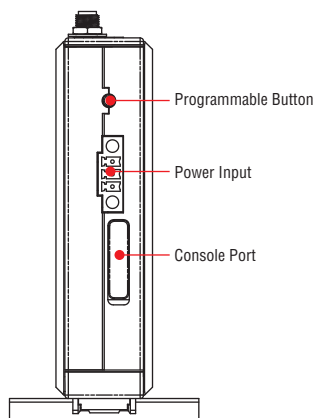
been optimized for use in energy monitoring systems, but is widely applicable to a variety of industrial solutions. With flexible interfacing options, this tiny embedded computer is a reliable and secure gateway for data acquisition and processing at field sites as well as a useful communication platform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

Appearance

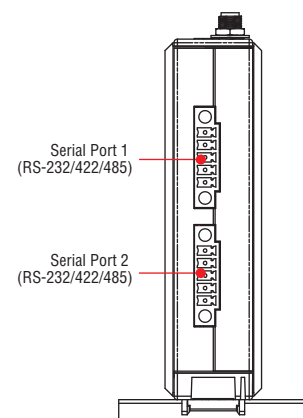
Front View



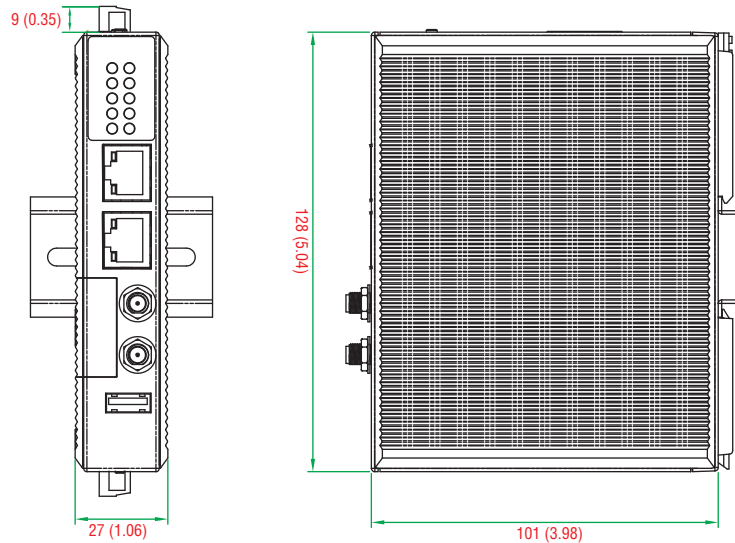
Top View



Bottom View



Dimensions



Hardware Specifications

Computer

CPU: ARMv7 Cortex-A8 1000 MHz
USB: USB 2.0 hosts x 1, Type A connector
DRAM: DDR3 SDRAM: 512 MB
OS (pre-installed): Debian ARM 8(Kernel 4.1)

Storage

Main Storage:
 2 GB micro SD card with OS pre-installed
Storage Expansion: SD socket for storage expansion

Ethernet Interface

LAN: Auto-sensing 10/100 Mbps ports (RJ45) x 2
Magnetic Isolation Protection: 1.5 kV built-in

Serial Interface

Serial Standards: RS-232/422/485 ports, software-selectable (5-pin terminal block connector) x 2
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: Max. 921600 bps

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: Polycarbonate plastic
Weight: 224 g (0.50 lb)
Dimensions: 101 x 27 x 128 mm (3.98 x 1.06 x 5.04 in)
Mounting: DIN-rail, wall (with optional kit)

Environmental Limits

Operating Temperature: -10 to 60°C (14 to 140°F)
Storage Temperature: -40 to 80°C (-40 to 176°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 24 VDC (3-pin terminal block, V+, V-, SG)
Input Current:
 • 450 mA @ 12 VDC
 • 225 mA @ 24 VDC
Power Consumption: 5.4 W (without external USB device attached)

Standards and Certifications

Safety: UL 60950-1
EMC: EC 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: DC Power: 0.5 kV
 IEC 61000-4-6 CS: 3 V
 IEC 61000-4-8: PFMF: 1 A/m, 60 s
Green Product: RoHS, CRoHS, WEEE

Reliability

Alert Tools: Built-in RTC (real-time clock)
Automatic Reboot Trigger: Built-in WDT (watchdog timer)
MTBF (mean time between failures)
Time: 1,149,242 hrs
Standard: Telcordia (Bellcore) Standard TR/SR

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 un-trusted hosts over an insecure network

Kernel: GNU/Linux 4.1

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

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 (sometimes considered short for Super-user Do) is a program designed to let system administrators allow some users to execute some commands as root (or another user). The basic philosophy is to give as few privileges as possible but still allow people to get their work done, and the Root account is disabled by default.

- Security Update of existing software packages: All packages in the UC-8112-LX1 could be updated for security purposes via Debian or Moxa's Advanced Packaging Tool (APT) server.

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

- SD Write Protection: Provides a mechanism for disabling SD write permission both in the filesystem SD and extended storage SD.

Ordering Information

Model	CPU	RAM	Serial	Ethernet	Micro SD Socket	SD Socket
UC-8112-LX1	1 Ghz	512 MB	2	2	✓ (2 GB MicroSD card with OS pre-installed)	✓ (1 GB SD card)

Package Checklist (computer)

- UC-8112-LX1 embedded computer
- Power jack
- 3-pin terminal block for power
- 5-pin terminal block for UART x 2

Optional Accessories

Power Adapters, Power Cords, Console Cables

Model Name	Package Contents	Description
PWR-24250-DT-S1	Power adapter with input: 100-240 VAC, 50-60 Hz, 1.5 A Output: 24 VDC, 2.5 A, 60 W for test and system development in the office under ambient temperature	Adapter
PWC-C7EU-2B-183	Power cord with 2-pin connector, Euro plug	Power Cord

Mounting Kits

Model Name	Package Contents	Description
WALLMOUNT-8100-01	Wall-mounting kit with screws	Wall-mounting Kit