UC-8100 Series

Arm-based wireless-enabled DIN-rail industrial computer with 2 serial ports and 2 LAN ports

> Armv7 Cortex-A8 300/600/1000 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
> Mini PCIe socket for cellular module
> Moxa Industrial Linux with 10-year long-term support
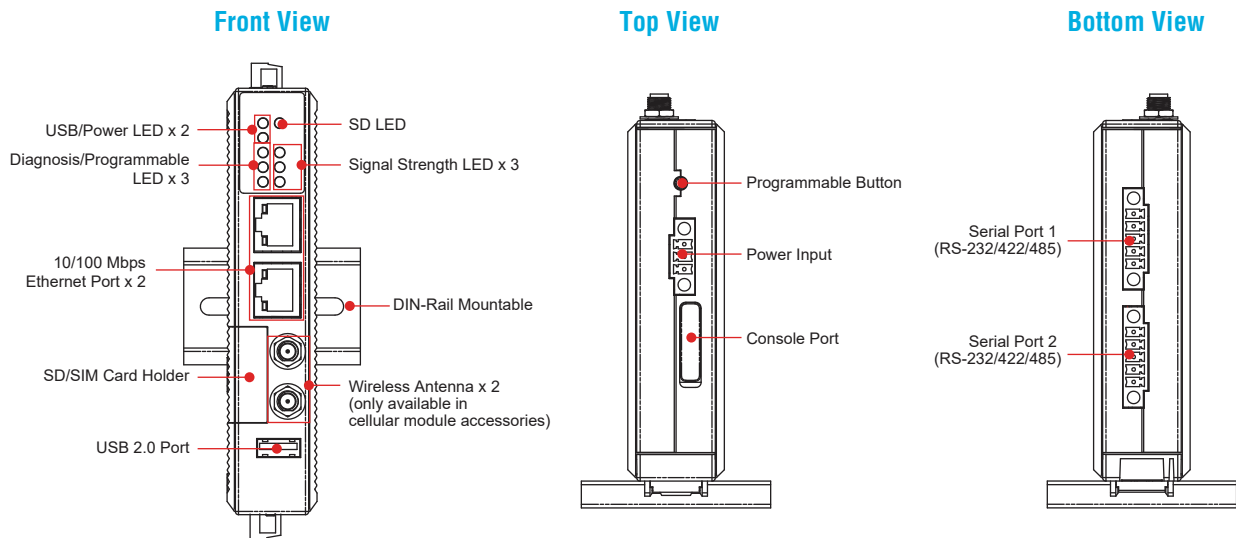
Introduction

The UC-8100 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 to a variety of complex communications solutions.

The UC-8100 is built around a Cortex-A8 Arm-based 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.
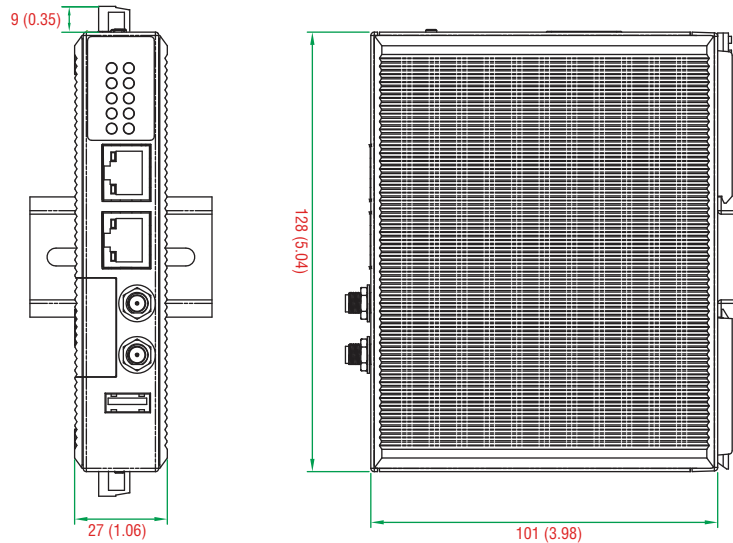
All units are thoroughly tested in a testing chamber, guaranteeing that the computing platforms are suitable for wide-temperature applications.

Appearance

Front View

- USB/Power LED x 2
- Diagnosis/Programmable LED x 3
- SD LED
- Signal Strength LED x 3
- 10/100 Mbps Ethernet Port x 2
- DIN-Rail Mountable
- SD/SIM Card Holder
- Wireless Antenna x 2 (only available in cellular module accessories)
- USB 2.0 Port

Top View

- Programmable Button
- Power Input
- Console Port

Bottom View

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

Dimensions

Unit: mm (inch)

9 (0.35)
128 (5.04)
27 (1.06)
101 (3.98)

Hardware Specifications

Computer
CPU: Armv7 Cortex-A8 300/600/1000 MHz
OS (preinstalled): Moxa Industrial Linux (Debian 9, Kernel 4.4)
USB: USB 2.0 hosts x 1, Type A connector
DRAM: DDR3 SDRAM
UC-8112-LX: 512 MB
UC-8162-LX: 512 MB
UC-8132-LX: 256 MB
UC-8131-LX: 256 MB

Storage
Main Storage: 8 GB eMMC flash with OS preinstalled
Storage Expansion: SDHC/SDXC 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 1 or 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 (UC-8112/8162/8132 with cellular module)
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 (0.49 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: -20 to 80°C (-4 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 cellular module and 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: External RTC (real-time clock)
Automatic Reboot Trigger: External WDT (watchdog timer)

MTBF (mean time between failures)
Time:
UC-8162-T-LX: 301,648 hrs
UC-8132-T-LX: 302,648 hrs
UC-8131-T-LX: 315,063 hrs
UC-8112-T-LX: 1,181,598 hrs
UC-8162-LX/UC-8132-LX: 1,195,173 hrs
UC-8131-LX: 1,465,546 hrs
UC-8112-LX: 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: Moxa Industrial Linux (Debian 9)
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 4.4
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: (UC-8132-LX, UC-8162-LX, UC-8112-LX only)
• 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).

Moxa Industrial Linux
Long-Term Support: Moxa Industrial Linux allows users to keep the same kernel version and Debian user space without needing to upgrade the entire system frequently. In addition, subscription services for each major release of Moxa Industrial Linux, throughout its 10-year life-cycle phase, provide security updates and bug fixes.
Cybersecurity:
• Moxa Industrial Linux comes with a built-in utility that helps developers implement a cybersecurity protection mechanism based on IEC 62443-4-2 international standards.
• Security Update of Existing Software Packages: All software packages installed on the UC-2100 Series can be updated either from Debian Linux's APT server or Moxa's APT server.

Ordering Information

Model	CPU	RAM	Serial	Ethernet	Mini PCIe Socket for Wireless Module	SD Socket
UC-8112-LX	1 Ghz	512 MB	2	2	✓	✓
UC-8162-LX	600 Mhz	512 MB	2	2	✓	✓
UC-8132-LX	300 Mhz	256 MB	2	2	✓	✓
UC-8131-LX	300 Mhz	256 MB	1	2	–	✓

Package Checklist (computer)
• UC-8100 embedded computer
• Power jack
• Console cable
• Quick installation guide (printed)
• Warranty card

: Optional Accessories

Power Adapters, Power Cords, Console Cables

Model Name	Package Contents	Description
PWR-24270-DT-S1	Adapter x 1	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
PWC-C7US-2B-183	Power Cord x 1	Power cord with 2-pin connector, USA plug
PWC-C7EU-2B-183	Power Cord x 1	Power cord with 2-pin connector, Euro plug
PWC-C7UK-2B-183	Power Cord x 1	Power cord with 2-pin connector, British plug
PWC-C7AU-2B-183	Power Cord x 1	Power cord with 2-pin connector, Australia plug
PWC-C7CN-2B-183	Power Cord x 1	Power cord with 2-pin connector, China plug
CBL-F9DPF1x4-BK-100	Console Cable x 1	Console cable with 4-pin connector

Wireless Package

Model Name	Package Contents	Description
CELLULAR-LTE-EU	• Cellular module x 1 • i-PEX MHF to SMA adapter with cable x 2 • Screw set 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)
WiFi-BGN	• WiFi module x 1 • i-PEX MHF to RP-SMA adapter with cable x 2 • Screw set x 1 • ANT-WDB-ARM-02 WiFi antenna x 1	WiFi Package

Antennas and Internal Antenna Cables

Model Name	Package Contents	Description
ANT-GPS-OSM-05-3M	Active GPS antenna, 26 dBi, 1572 MHz, L1 band antenna for GPS	GPS Antenna
ANT-3G-SMA	SMA male antenna for cellular, support bands: 850/900/1800/1900/2100 MHz	3G Antenna
ANT-LTE-OSM-03-3m BK	Multi-band antenna that covers 700-2700 MHz. Specially designed for 2G, 3G, and 4G applications. Magnetic mounting is available.	4G Antenna
ANT-LTE-ASM-04 BK	LTE Stick antenna that covers 704-960/1710-2620 MHz providing omnidirectional radiation with a gain of 4.5 dBi.	4G Antenna
ANT-LTE-ASM-05 BK	LTE stick antenna that covers 704-960/1710-2620 MHz with a gain of 5 dBi.	4G Antenna
ANT-LTE-OSM-06-3m BK MIMO	Multi-band antenna that covers 700-2700/2400-2500/5150-5850 MHz frequencies. Screw-fastened mounting and full IP67 waterproofing are available.	4G Antenna
ANT-WDB-ARM-02	RP-SMA male antenna for WiFi; supports the 2.4 GHz band.	WiFi Antenna
A-CRF-MHFSF	i-PEX MHF (male, on cellular module) to SMA (female, on top cover) adapter with cable. For when you need to install a GPS antenna.	Cellular antenna cable
CRF-MHF/SMA(M)-14.2	i-PEX MHF (male, on Wi-Fi module) to RP-SMA (female, on top cover) adapter with cable.	WiFi antenna cable

Mounting Kits

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