UC-5100 Series

Preliminary

Communication-centric RISC computing platform for industrial automation

- ARMv7 Cortex-A8 1000 MHz processor
- Dual auto-sensing 10/100 Mbps Ethernet ports
- 4 software-selectable RS-232/422/485 ports supporting all signals
- Dual Industrial CAN 2.0 A/B protocol supported
- Moxa Industrial Linux with 10-year superior long term support
- Mini PCIe socket for Wi-Fi/Cellular module
- Micro SD socket for storage expansion
- Supports TPM v2.0 (optional)
- -40 to 85°C wide temperature range and -40 to 70°C with LTE enabled

Introduction

The UC-5100 Series embedded computers are designed for industrial automation applications. The computers feature 4 RS-232/422/485 full signal serial ports with adjustable Pull-High/Pull-Low resistors, dual CAN ports, dual LANs, 4 digital input channels, 4 digital output channels, a SD socket in a compact, front-end access housing.

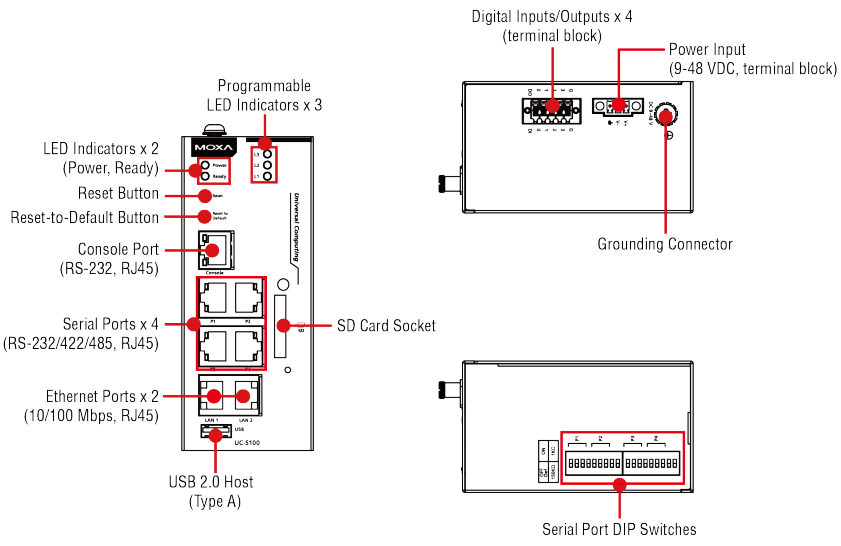
To fulfill various industrial applications, the UC-5100 Series computing platform provides models with dual CANopen protocol supported CAN ports and mini PCIe socket for wireless connection featuring a dual SIM design for network redundancy.

The UC-5100's vertical DIN-rail form factor makes it easy to install the computers in a small cabinet. This space-saving solution also facilitates easy wiring, making the UC-5100 a great choice as front-end embedded controllers for industrial applications.

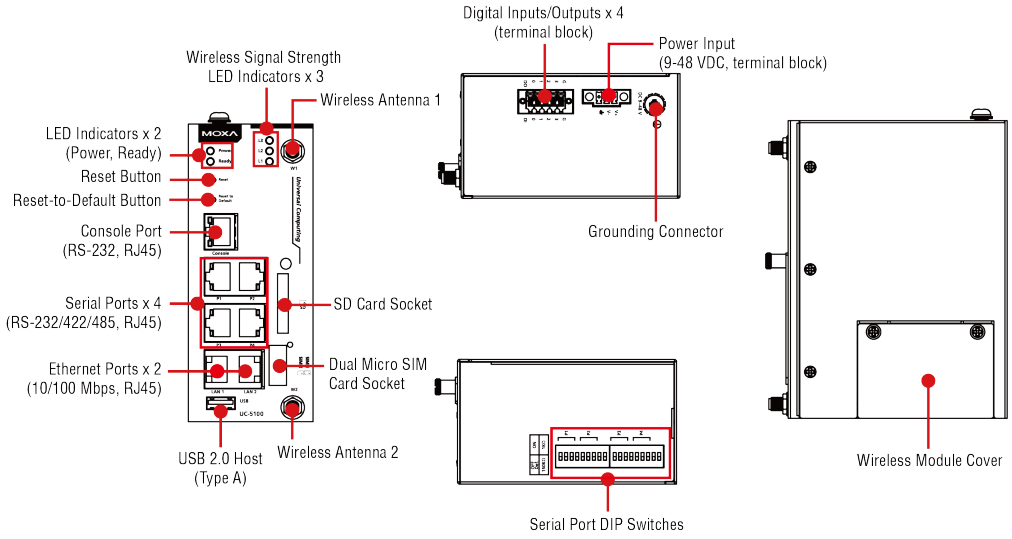
Furthermore, all the models are equipped with MOXA's industrial grade Linux for users to enjoy its superior long term support operating system as well as the optimized software features.

Appearance

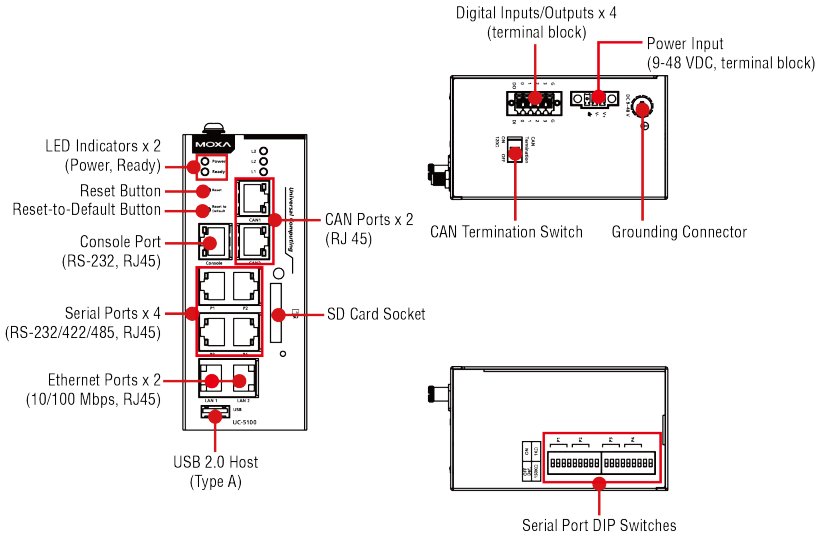
UC-5101



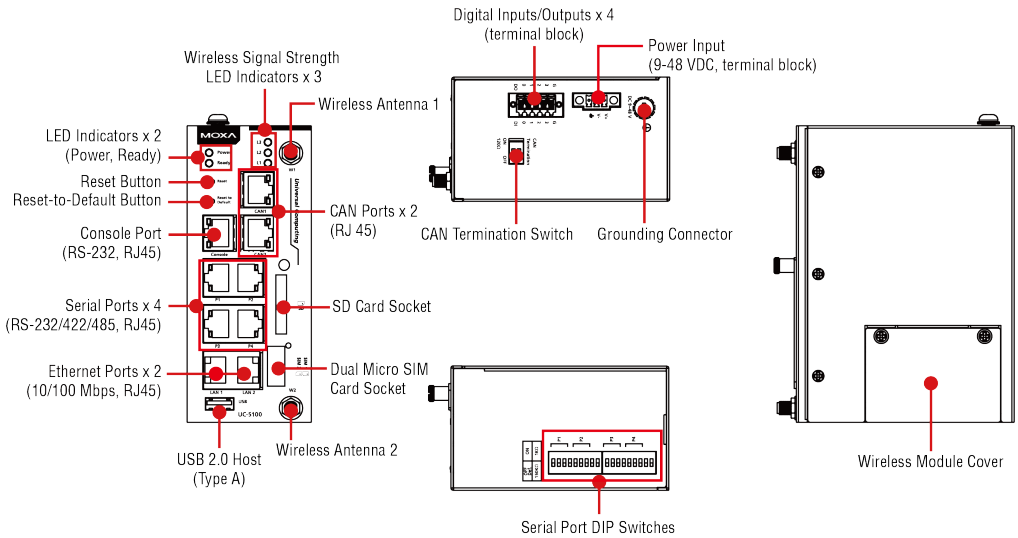
UC-5102



UC-5111

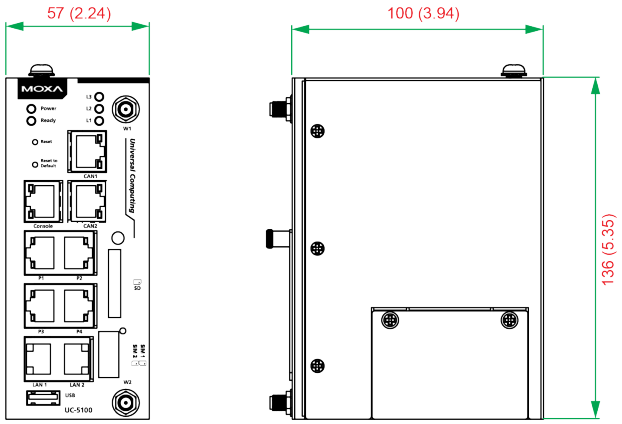


UC-5112



Dimensions

Unit: mm (inch)



Hardware Specifications

Computer
CPU: ARMv7 Cortex-A8 1000 MHz
OS (pre-installed): Moxa Industrial Linux (Debian 9, Kernel 4.4)
DRAM: 512 MB DDR3 SDRAM

Storage
Built-in: 8 GB eMMC flash with OS pre-installed
Storage Expansion: SDHC/SDXC socket for storage expansion

Other Peripherals
TPM: v2.0 by request (SPI interface)

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

Serial Interface
Serial Standards: 4 RS-232/422/485, software selectable port (RJ45)
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: 50 bps to 921.6 kbps

Serial Signals
RS-232: TxD, RxD, RTS, CTS, DTR, DSR, DCD, 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, Ready x 1
LAN: LED located on the RJ45 connector, 10M/Link x 1, 100M/Link x 1
Serial: TxD x 1, RxD x 1
Signal Strength / Programmable: L1, L2, L3 (LEDs located on the RJ45 connector)

Switches and Buttons
Push Button: Initially configured to reboot and to reset the device to factory defaults
Dip Switch: For configuring the serial port Pull-High/Pull-Low resistors

Physical Characteristics
Housing: SECC + Al 5052
Weight: 600 g (1.32 lb)
Dimensions: 60 x 137 x 100 mm (2.36 x 5.39 x 3.94 in)
Mounting: DIN rail, wall (with optional kit)

Environmental Limits
Operating Temperature:
Standard Models: -10 to 60°C (14 to 140°F)
Wide Temp. Models: -40 to 85°C (-40 to 185°F)
Storage Temperature:
Standard Models: -20 to 70 °C (-4 to 158°F)
Wide Temp. Models: -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, 11 ms

Power Requirements
Input Voltage: 9 to 48 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, IEC 60950-1
EMC: EN 55032/24, EN 61000-6-2/6-4, KC, RCM, VCCI, EAC
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: 10 V/m
IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
IEC 61000-4-5 Surge: Power: 2 kV; Power: 0.5 kV; Signal: 1 kV
IEC 61000-4-6 CS: 10 V
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: Moxa Industrial Linux (Debian 9)
OS Mode: Network performance mode / Real-time mode
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 insecure network
Kernel: GNU/Linux 4.4 CIP + RT-patch
System Shell: DASH (default), BASH
Text Editor: vim, nano
File System: JFFS2, NFS, Ext3, Ext4, VFAT, OverlayFS, NTFS
Internet Protocol Suite: TCP, UDP, IPv4, IPv6, SNMPv2, v3, ICMP, ARP, HTTP, CHAP,PAP,DHCP, NTP,NFS, SSH, PPP, SFTP, RSYNC, SSL, SCP
Programming Language Support: PHP, Perl, Python
Internet Security Suite: OpenVPN, Netfilter/iptables, IPsec
Cryptographic Hardware Accelerators: AES, SHA, OpenSSL, random generator
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
• Modem Manager
• Cellular Management Utility
• Wi-Fi Management Utility

Application Development Software:
• Toolchain ARM GNUeabihf 6.3
• GNU C/C++ cross-compiler
• GNU C library
• GDB source-level debugging server

Moxa Industrial Linux

Robust File system: Moxa Industrial Linux is integrated with OverlayFS to mitigate the chance of system corruption
Network Performance / Real Time Mode: The system could be configured to operate in network enhanced mode or soft real time mode
Cybersecurity:
• MX-security utility for creating a protection mechanism to meet cybersecurity requirements
• Security Update of Existing Software Packages: All software packages installed on the UC-5100 Series can be automatically updated using Debian Linux's Advanced Packaging Tool (APT) server or Moxa's server
Real COM Mode: Support NPort's Real COM mode driver to communicate with NPort device servers

Ordering Information

Model	CPU	RAM	Storage	Ethernet	Serial	CAN	SD	Mini PCIe	Operating Temperature
UC-5101-LX	1 GHz	512 MB	8 GB	2	4	–	1	–	-10 to 60°C
UC-5102-LX	1 GHz	512 MB	8 GB	2	4	–	1	1 (dual sim socket)	-10 to 60°C
UC-5111-LX	1 GHz	512 MB	8 GB	2	4	2	1	–	-10 to 70°C
UC-5112-LX	1 GHz	512 MB	8 GB	2	4	2	1	1 (dual sim socket)	-10 to 60°C
UC-5101-T-LX	1 GHz	512 MB	8 GB	2	4	–	1	–	-40 to 85°C
UC-5102-T-LX	1 GHz	512 MB	8 GB	2	4	–	1	1 (dual sim socket)	-40 to 85°C
UC-5111-T-LX	1 GHz	512 MB	8 GB	2	4	2	1	–	-40 to 85°C
UC-5112-T-LX	1 GHz	512 MB	8 GB	2	4	2	1	1 (dual sim socket)	-40 to 85°C

Optional Accessories (can be purchased separately)

Power Adapters, Power Cords

Model Name	Package Contents	Description
PWR-24270-DT-S1	• 1 x Power adapter	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, 2.7 A, 60 W)
PWC-C7US-2B-183	• 1 x Power cord	10A/125V North American (US) power cord, 183 cm
PWC-C7EU-2B-183	• 1 x Power Cord	10A/250V Continental European (EU) power cord, 183 cm
PWC-C7UK-2B-183	• 1 x Power Cord	10A/250V United Kingdom (UK) power cord, 183 cm
PWC-C7AU-2B-183	• 1 x Power Cord	2.5A/250V Australian (AU) power cord, 183 cm
PWC-C7CN-2B-183	• 1 x Power Cord	10A/250V China (CN) power cord, 183 cm

Wireless Packages

Model Name	Package Contents	Description
UC-LTE-EU	• 1 x Cellular module • 2 x Mini PCI/e mount screw sets	LTE regions: Asia, Europe Penta-Band LTE: Bands 1, 3, 8, 20, 28* (700*, 800, 900, 1800, 2100 MHz), Dual-Band GSM 900 and 1800 MHz
UC-LTE-AUS	• 1 x Cellular module • 2 x Mini PCI/e mount screw sets	LTE regions: Australia, New Zealand Quad-Band LTE: Bands 3, 5, 8, 28 (1800, 850, 900, 700 MHz), Tri-Band UMTS: Bands 1, 5, 8 (WCDMA/FDD 2100, 850, 900 MHz)
UC-LTE-CN	• 1 x Cellular module • 2 x Mini PCI/e mount screw sets	LTE(FDD): B1,B3,B8; LTE(TDD): B39,B40,B41(38), all bands with diversity DC-HSPA+: B1,B9,B5,B8; TDS: B34, B39, all bands with diversity GSM: 1800/900MHz
UC-LTE-CAT1-EU	• 1 x Cellular module • 2 x Mini PCI/e mount screw sets	LTE regions: Asia, Europe Penta-Band LTE: Bands 1, 3, 8, 20, 28* (700*, 800, 900, 1800, 2100 MHz), Dual-Band GSM 900 and 1800 MHz
UC-LTE-CAT1-AUS	• 1 x Cellular module • 2 x Mini PCI/e mount screw set	LTE regions: Australia, New Zealand Quad-Band LTE: Bands 3, 5, 8, 28 (1800, 850, 900, 700 MHz), Tri-Band UMTS: Bands 1, 5, 8 (WCDMA/FDD 2100, 850, 900 MHz)
UC-LTE-CAT4-CN	• 1 x Cellular module • 2 x Mini PCI/e mount screw set	LTE(FDD): B1,B3,B8; LTE(TDD): B39,B40,B41(38), all bands with diversity DC-HSPA+: B1,B9,B5,B8; TDS: B34, B39, all bands with diversity GSM: 1800/900MHz
UC-WiFi-USB	• 1 x WiFi module • 2 x Mini PCI/e mount screw set	Operating Frequency: 802.11 ac/a/b/g/n ISM Band 2.412 GHz to 2.472 GHz, 5.180 MHz to 5.825 MHz (Subject to local regulations) Modulation: 802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11a/g: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11n: OFDM (BPSK, QPSK, 16-QAM, 64-QAM) 802.11ac: OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM

Antennas and Internal Antenna Cables

Model Name	Package Contents	Description
ANT-WDB-ARM-0202	• 1 x WiFi antenna	1.8/1.8 dBi, RP-SMA (male) antenna
ANT-LTE-OSM-03-3m BK	• 1 x LTE antenna	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	• 1 x LTE antenna	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	• 1 x LTE antenna	LTE stick antenna that covers 704-960/1710-2620 MHz with a gain of 5 dBi.
ANT-LTE-OSM-06-3m BK MIMO	• 1 x LTE antenna	Multi-band antenna that covers 700-2700/2400-2500/5150-5850 MHz frequencies. Screw-fastened mounting and full IP67 waterproofing are available.
SMA-Adapter	• 2 x SMA adapter	SMA Adapter for UC-2104 to convert to SMA male connector

Mounting Kits

Model Name	Package Contents	Description
DK-UC-5000	• DIN-rail Mounting kit x 1 • Screws x 4	DIN-rail Mounting kit with screws
WM-UC-5000	• Wall Mounting kit x 2 • Screws x 4	Wall Mounting kit with screws

Package Checklist

- UC-5100 embedded computer
- Power jack
- Console cable
- Quick installation guide (printed)
- Warranty card

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