



# UC-7112 Plus/7112/7110

## Quick Installation Guide

Fifth Edition, January 2014

### 1. Overview

The Moxa UC-7112 Plus, UC-7112, and UC-7110 are mini size RISC-based ready-to-run embedded computers that feature dual 10/100 Mbps Ethernet ports and two RS-232/422/485 serial ports in a built-in  $\mu$ Clinix ARM9 box. In addition, the UC-7112 provides an internal SD socket for storage expansion, to offer high performance communication and unlimited storage in a super compact, palm-size box. The UC-7112 Plus, UC-7112, and UC-7110 are the right solutions for embedded applications that use a lot of memory, but that must be housed in a small physical space without sacrificing performance.

### 2. Package Checklist

Before installing the UC-7112 Plus/7112/7110, verify that the package contains the following items:

- 1 UC-7112 Plus, UC-7112, or UC-7110
- Quick Installation Guide
- Document & Software CD
- Cross-over Ethernet cable: RJ45 to RJ45, 100 cm
- Console port cable: CBL-4PINDB9F-100 (4-pin header to female DB9 cable, 100 cm)
- Universal Power Adaptor
- Product Warranty Statement

#### Optional Accessories

- DK-35A DIN-Rail Mounting Kit (35 mm)

*NOTE: Please notify your sales representative if any of the above items are missing or damaged.*

### 3. Hardware Introduction

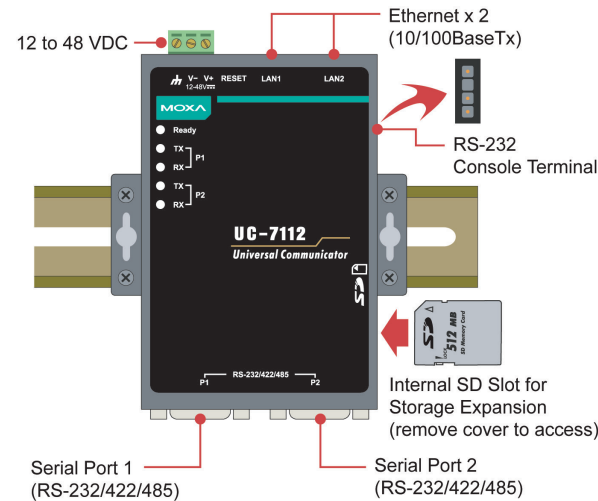
#### LED Indicators

The following LED indicators are located on the top panel of the UC-7112 Plus/7112/7110.

LED Name	LED Color	LED Function
Ready	Green	Power is on and functioning normally.
P1/P2 (Tx)	Green	Serial port 1 or 2 is transmitting data.
	Off	Serial port 1 or 2 is not transmitting data.
P1/P2 (Rx)	Yellow	Serial port 1 or 2 is receiving data.
	Off	Serial port 1 or 2 is not receiving data.

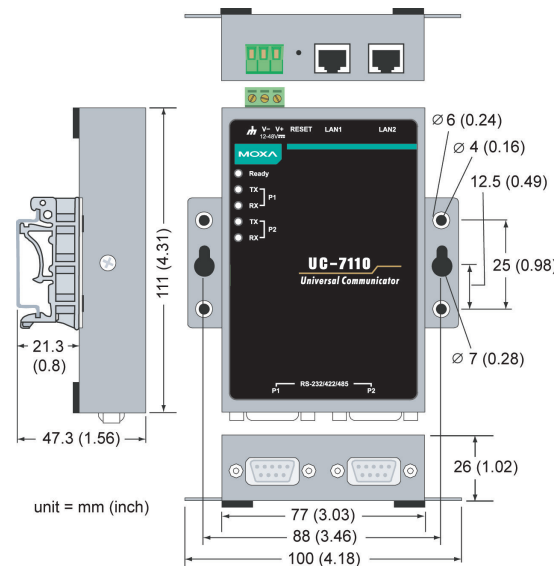
#### UC-7112 Plus/7112/7110 Top View

The top view of the UC-7112 is shown in the following figure. The UC-7112 Plus and UC-7110 look similar, except that the UC-7110 does not have an internal SD slot.



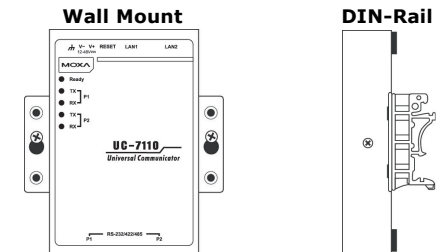
#### UC-7112 Plus/7112/7110 Dimensions

The dimensions of the three products are shown in the following figure.



### 4. Hardware Installation Procedure

- STEP 1:** Remove the UC from the box and attach the power adaptor.
- STEP 2:** Connect the UC's serial console cable to your PC's RS-232 COM port for initial setup through the console terminal.
- STEP 3:** Connect the UC to a network. Use a standard straight-through Ethernet cable to connect to a hub or switch. When setting up or testing the UC, you might find it convenient to connect directly to your computer's Ethernet port. In this case, use a cross-over Ethernet cable.
- STEP 4: Install Secure Digital (SD) Memory Card (UC-7112 and UC-7112 Plus only)**  
To install an additional SD card, you must first remove the UC-7112's outer cover to access the slot. The internal SD socket is located at the back side of the UC-7112 on the bottom board; you can find the SD socket on the right, a little lower than the cover screw. Plug the SD card directly into the socket. To remove the card, press it in first, and then remove your finger. The card will pop out enough to allow you to remove it.
- STEP 5: Placement Options**  
In addition to placing the UC on a desktop or other horizontal surface, you may also make use of the DIN-Rail or Wall Mount options, as illustrated here.



### 5. Software Installation Procedure

- STEP 1:** Insert the UC's CD-ROM into your Windows or Linux PC, and then use Acrobat Reader to read the UC-7112/7110 Series User's Manual.
- STEP 2:** Install the UC's tool chain, which is on the CD-ROM. The tool chain consists of the following components:
- 1. UC Finder:** Broadcast search for the UC's IP address on your LAN. The UC supports both Windows and Linux environments.
  - 2. Cross Compiler:** Arm-elf-gcc for  $\mu$ Clinix platforms (UC-7112/7110), and Arm-linux-gcc for embedded Linux platform (UC-7112 Plus). Both options are C/C++ PC cross compilers, which are gcc compilers that run on an x86 PC, but create an execution file for Arm-based platforms, such as the UC-7112/7110.

**3. GNU C Library:** The GNU standard POSIX C Library is supported for both the UC-7112 Plus's Linux platform, and the UC-7112/7110's uClinux platform. Glibc is for Linux and  $\mu$ Clibc is for uClinux, which is an abbreviation for "microcontroller C library."  $\mu$ Clibc was created to support  $\mu$ linux, a Linux port for MMU-less microcontrollers, such as the ARM9 installed in the UC-7112/7110. For more information, visit <http://www.uclibc.org>.

**STEP 3:** Edit source code on a Linux PC.

**STEP 4:** Use the Cross Compiler to compile the source code, and then use FTP to download the program to the UC.

**STEP 5:** Run your program.

## 6. System Commands

**busybox: Linux /  $\mu$ Clinux normal command utility collection**

### File manager

<b>cp</b>	copy file
<b>ls</b>	list file
<b>ln</b>	make symbolic link file
<b>mount</b>	mount and check file system
<b>rm</b>	delete file
<b>chmod</b>	change file owner & group & user
<b>chown</b>	change file owner
<b>chgrp</b>	change file group
<b>sync</b>	sync file system; save system file buffer to hardware
<b>mv</b>	move file
<b>pwd</b>	display active file directly
<b>df</b>	list active file system space
<b>du</b>	estimate file space usage
<b>mkdir</b>	make new directory
<b>rmdir</b>	delete directory
<b>head</b>	print the first 10 lines of each file to standard output
<b>tail</b>	print the last 10 lines of each file to standard output
<b>touch</b>	update the access and modification times of each file to the current time

### Editor

<b>vi</b>	text editor
<b>cat</b>	dump file context
<b>grep</b>	print lines matching a pattern
<b>cut</b>	remove sections from each line of files
<b>find</b>	search for files in a directory hierarchy
<b>more</b>	dump file by one page
<b>test</b>	test if file exists or not
<b>echo</b>	echo string

### Process

<b>kill</b>	kill process
<b>killall</b>	kill process by name
<b>ps</b>	report process status
<b>sleep</b>	suspend command on time (seconds)

### Network

<b>ping</b>	ping to test network
<b>route</b>	routing table manager
<b>netstat</b>	display network status
<b>ifconfig</b>	set network IP address
<b>tftp</b>	tftp protocol
<b>telnet</b>	user interface to TELNET protocol
<b>ftp</b>	file transfer protocol
<b>iptables-restore</b>	restore iptables configuration file to network
<b>iptables</b>	iptables command
<b>iptables-save</b>	save recent iptables configuration to file

### Other

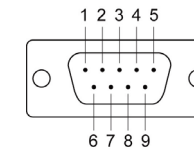
<b>dmesg</b>	dump kernel log message
<b>stty</b>	set serial port
<b>mknod</b>	make device node
<b>free</b>	display system memory usage
<b>date</b>	print or set the system date and time
<b>env</b>	run a program in a modified environment
<b>clear</b>	clear the terminal screen
<b>reboot</b>	reboot / power off/on the server
<b>halt</b>	halt the server
<b>gzip, gunzip, zcat</b>	compress or expand files
<b>hostname</b>	show system's host name
<b>tar</b>	tar archiving utility

### Moxa special utilities

<b>cat /etc/version</b>	show user directory version
<b>upramdisk</b>	mount ramdisk
<b>downramdisk</b>	unmount ramdisk
<b>kversion</b>	show kernel version
<b>fsversion</b>	show the root file system (firmware) version
<b>setinterface</b>	set UART interfaces program

## 7. Pin Assignments

### DB9 Male



Pin	RS-232	RS-422	RS-485 (4-wire)	RS-485 (2-wire)
1	DCD	TxDA(-)	TxDA(-)	---
2	RxD	TxDB(+)	TxDB(+)	---
3	TxD	RxDB(+)	RxDB(+)	DataB(+)
4	DTR	RxDA(-)	RxDA(-)	DataA(-)
5	GND	GND	GND	GND
6	DSR	---	---	---
7	RTS	---	---	---
8	CTS	---	---	---

### Serial Console Port



Pin	Signal
4	GND
3	NC*
2	RxD
1	TxD



\*NC=Not Connected

## 8. Environmental Specifications

Power requirements	12 to 48 VDC
Operating temp.	-10 to 60°C (14 to 140°F), 5 to 95% RH
Storage Temperature	-20 to 80°C (-4 to 176°F), 5 to 95% RH
Serial protection	15 KV ESD for serial port
Magnetic isolation	1.5 KV for Ethernet
Regulatory approvals	FCC Class A, CE Class A, UL, cUL, TÜV
Warranty	5 years

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The Americas: +1-714-528-6777 (toll-free: 1-888-669-2872)  
 Europe: +49-89-3 70 03 99-0  
 Asia-Pacific: +886-2-8919-1230  
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