

Front-end Embedded Computer for Device Networking Solutions

## Universal Communicator

Front-end embedded computer for device networking

### RISC-based Communication Computer



No fan, no hard drive design



Moxa's Universal Communicator series of RISC-based embedded computers are ideally suited for device networking applications. Each product comes standard with dual 10/100 Mbps Ethernet ports, 2 or 8 RS-232/422/485 3-in-1 serial ports, USB 2.0, PCMCIA, Compact Flash interface for storage, and wireless

communication expansion capability. Open source code that runs on the pre-installed Linux OS is readily available, letting software programmers concentrate on developing their own application programs.

### Product Selection Guide

Model	UC-7420	UC-7410	UC-7110
			
<b>CPU</b>	Intel Xscale IXP422 (266 MHz)		ARM940T (166 MHz)
<b>Memory (ROM/RAM)</b>	32 MB/128 MB		8 MB/16 MB
<b>OS</b>	MontaVista Linux		$\mu$ Clinux
<b>Ethernet Ports</b>	2		2
<b>Serial Ports</b>	8 x RS-232/422/485 with RJ45 Connectors		2 x RS-232/422/485 with DB9 Connectors
<b>Expansion Interface</b>	PCMCIA x 1	None	None
<b>Extra Storage</b>	CF x 1, USB 2.0 host x 2	None	None
<b>User Interface</b>	LCM/Keypad		None

## Powerful Communication and Computing

### • Intel Xscale IXP-422 CPU inside (for UC-7400 Series)

The IXP-422's RISC-based architecture and modern semiconductor technology differs markedly from the X86's CISC design, providing UC-7400 with a powerful computing engine and communication function. The ultra low power consumption (less than 2W) CPU makes UC-7400 series into a high performance device that won't overheat.

### • Two 10/100M LAN Ports

The two 10/100M LAN ports with built-in IXP-422 provide you with a more reliable redundant network application, and hardware encryption (DES, 3DES, AES, etc.) gives your applications better security. Use these two ports for redundant or gateway applications.

### • Powerful Serial Engine

UC-7400 series uses the MOXA MU860 8-port serial processor with on-chip hardware/software flow control to prevent any data loss. Each port comes with a 128-byte Transmit/Receive FIFO and Burst Data Mode for great performance.

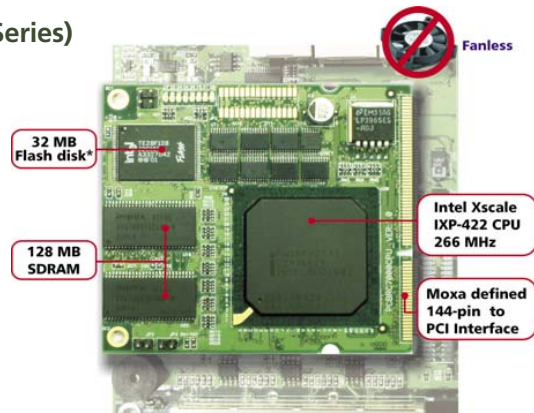
MU860 can generate a more precise baud rate for special applications. For example, traditional UARTs will generate a 230400 bps baud rate for 250000 bps applications (8% error), but MU860 can give you 254234 bps, with an error of only 1.7%.

### • Versatile network connections

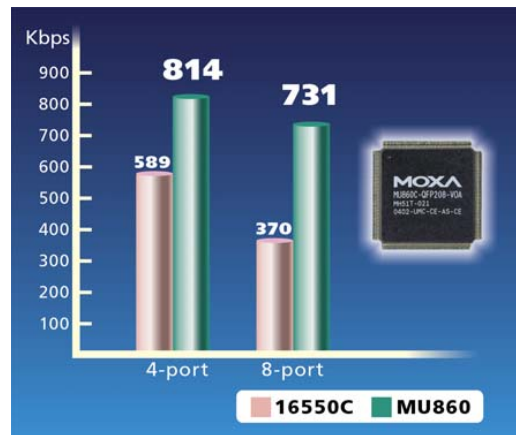
UC-7400 Series features versatile network connection interfaces, giving you the flexibility of choosing the most appropriate connection equipment for your application.

Use an external GPRS modem or V.90 modem via the console port, or choose the LAN port with ADSL broadband connection to communicate with the Internet world.

UC-7420's wireless-ready design lets you use the wireless PCMCIA card provided by Moxa to connect your devices to a wireless connection.



With no hard disk and fan, the UC-7400 Series cordless design is well-suited for harsh, outdoor environments.



## • Robust Design for Industrial Applications

### Wall-mount design for easy installation

The compact size means that Universal Communicator occupies less space, and the wall-mount design gives you the freedom to place it anywhere.

### No fan, No hard disk operation

Since Universal communicator uses an on-board flash for storage and CF for storage expansion, system failures caused by a low MTBF hard drive are avoided. And with the RISC CPU, which generates almost no heat, Universal communicator does not need a fan to cool down the system, providing you with a more reliable system.



Wall-mount design

### Field power friendly

The wide range 12 to 48 VDC power input design makes Universal Communicator ready for use with field 24 VDC or 48 VDC power. An optional AC power adaptor is also available for 110 to 240 VAC power inputs.

## • Robust File System Architecture

### File-Oriented Process

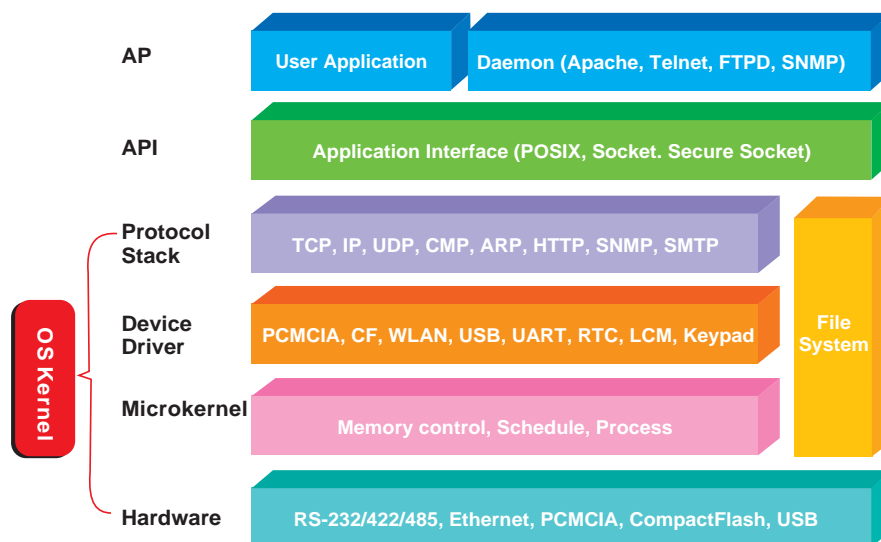
Universal communicator uses a real file system architecture so that users can transfer files via FTP or NFS. Users can also install their PC application web page on Universal Communicator using on the original file format.

### JFFS2 file system for on-board Flash ROM

Universal Communicator supports JFFS2 (Journaling Flash File System) for on-board Flash ROM. JFFS2 is specially designed for Flash ROM characteristics to prevent unintentional file system errors.

### Supports EXT2/EXT3/VFAT/FAT file system formats for additional storage devices

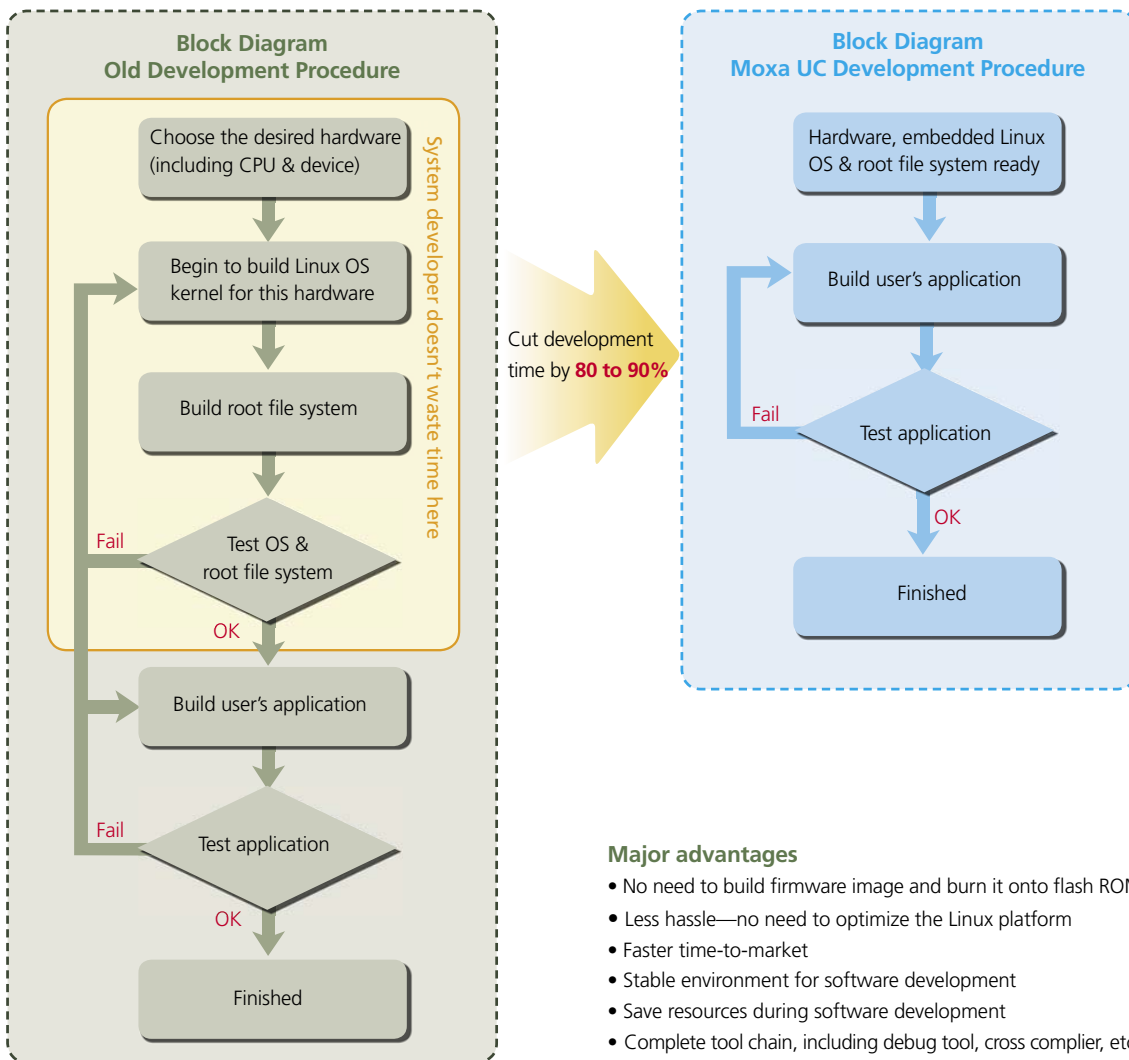
With UC-7400 series Universal Communicator, expand your storage area by attaching devices via a Compact Flash slot or USB 2.0 port. EXT2/EXT3/VFAT/FAT file system formats are supported, so that your files can be read by either the Universal Communicator or a PC.



## Innovative Linux Platform

The embedded open Linux platform used by Universal Communicator makes software development easier and faster. With the pre-installed platform, software developers do not need to optimize the Operating System Kernel and Root File System, saving resources and offering faster time-to-market, but with less risk. Software developers can put their own application programs on the Linux platform without the need to build the firmware image, which comprises the Operating System Kernel, Root File System, and application programs. In other words, software developers no longer need to burn the firmware image onto the flash ROM.

In the past, software developers had to choose suitable Operating System Kernel Services first, before creating a customized Operating System Kernel. Furthermore, which utilities and Root File System format would be adopted was another troublesome problem.



### Major advantages

- No need to build firmware image and burn it onto flash ROM
- Less hassle—no need to optimize the Linux platform
- Faster time-to-market
- Stable environment for software development
- Save resources during software development
- Complete tool chain, including debug tool, cross compiler, etc.

## • Easier Application Development with Universal Communicator

### Open Linux architecture for easy development

The pre-installed Linux OS provides an open software operating system for your software development. This means that software written for the desktop PC is easily ported to the Universal Communicator platform by using a GNU cross compile—but without needing to modify the code.

### How to develop your application with Universal communicator

**Step 1 :** Set up the development environment

#### For Linux Environments

- Install Linux on your PC (Redhat 7.2 or above is recommended)
- Install the UC tool chain (Cross compiler, GlibC, GDB), included on the CD-ROM, to your Linux PC
- Configure the IP, Netmask, etc.

#### For Windows Environments

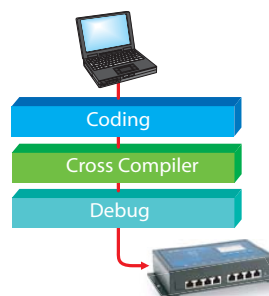
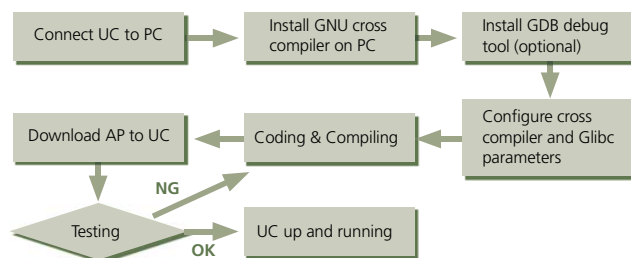
- Install the UC windows tool chain (Cross compiler, GlibC, GDB), included on the CD-ROM, to your Windows PC.
- Configure the IP, Netmask, etc.

**Step 2 :** Coding

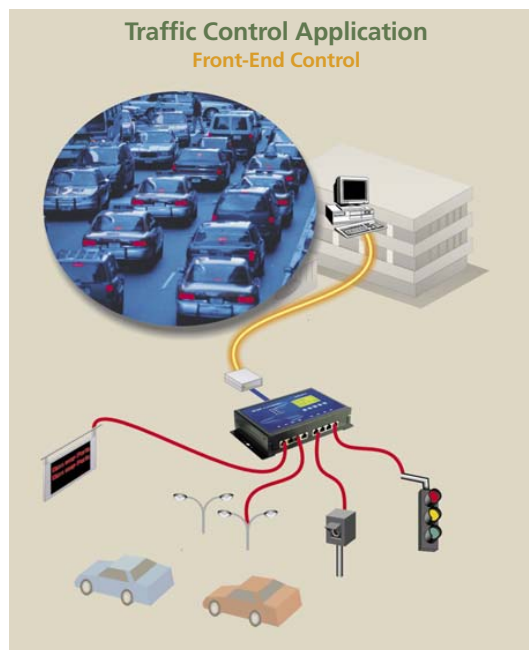
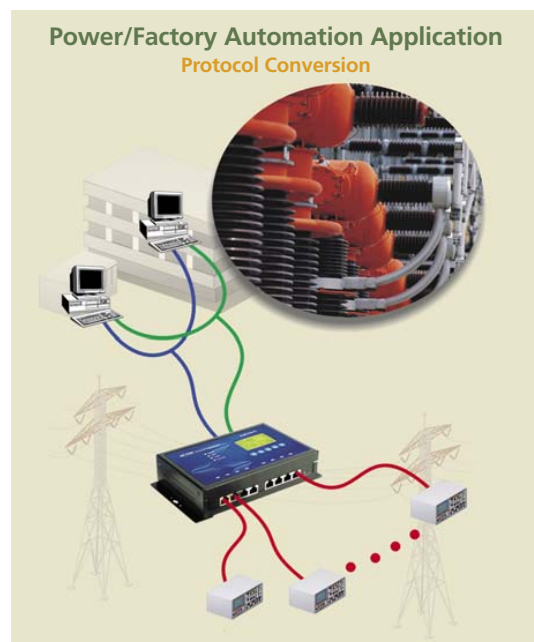
- Develop a C or C++ User Application on your PC.
- Compile C programs and link to the library with the Moxa UC tool chain.

**Step 3 :** Deployment

- Download the finished program via FTP to your UC.
- UC, with your own program installed, is ready to go.

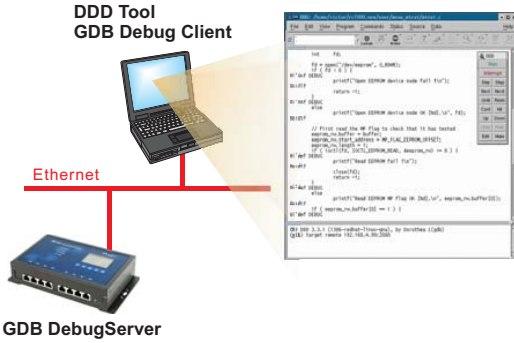


## Typical Applications



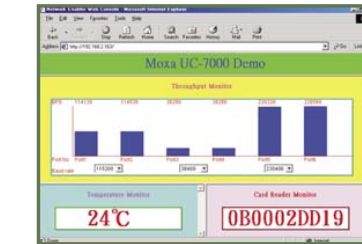
## • Source level debug

Universal Communicator (UC-7400 Series only) has a built-in GDB server so that software developers can use freeware, such as DDD in Linux environments, for source level debugging. We also provide the Insight debug tool for windows environment developers.



## • Embedded Web Server for Web applications

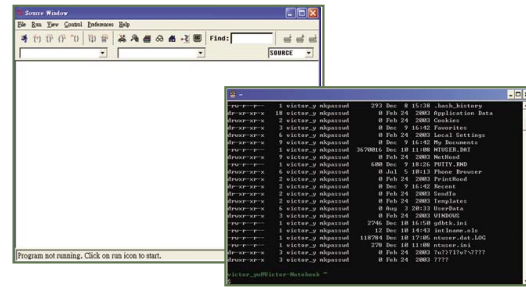
Universal Communicator has a pre-installed web server daemon that lets you set up your web application easily. Edit your web application with any familiar web tool, and then download the site to the Universal Communicator. Enjoy the benefits of web applications that are viewable with any popular web browser.



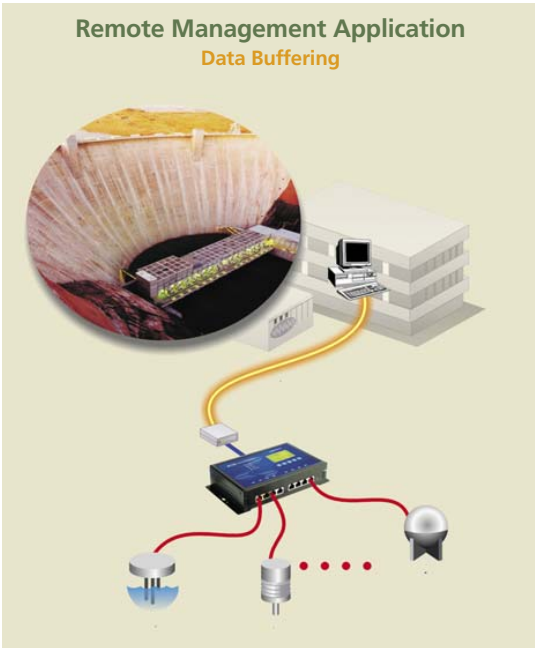
## • Windows Tool Chain

The Windows Tool Chain is beneficial when working on Microsoft Windows systems. Compared to using middleware with an extra Linux OS, the Windows Tool Chain gives you a simpler, more stable operating environment.

- Easily installed on Windows systems
- Provides a true Linux simulation environment



## Remote Management Application Data Buffering



## Fleet Management Application Wi-Fi/GPRS Management

