

The automatic monitoring and control of traffic  
2008-04-22

**Location / Country :** Taiwan

**Product Solutions:**

[UC-7410, UC-7420](#)

RISC-based ready-to-run computer with 8 serial ports, dual LANs, USB, PCMCIA,  
CompactFlash

**Introduction**

Project Introduction

Techniques for controlling traffic have been in use ever since the automobile became the standard mode of transportation in the early 1900's. Perhaps the most familiar example is the stoplight, which in its most basic form uses a simple timer to determine when the light will change. The timed traffic light poses a problem for low-traffic intersections, since cars may need to wait at a red light for an extended period of time, even when there are no cars driving by on the cross street. This problem is usually solved by embedding a simple inductor-type automobile sensor just under the surface of the pavement. Controlling high-traffic intersections is more complicated, and is best handled using algorithms that depend on the number of cars coming from all directions at any given time, or using human operators to switch the lights based on a visual observation of the number of cars waiting at the intersection.

In addition to traffic lights, other sensors and traffic related devices commonly used include cameras, roadside LED displays, street lights, parking lot entrances, and even parking meters. What has been missing until recently is an easy and economical way to monitor and control the devices located in a given area, such as at an intersection or a self service parking lot. MOXA's UC-7420, a miniature front-end computer with eight RS-232/422/485 serial ports, dual Ethernet ports, PCMCIA card that supports 802.11b/g wireless LAN capability, and an industrial strength no fan, no hard drive design, is ideal for these kinds of applications. The UC-7420's built-in Linux operating system makes it easy to install software, and the CompactFlash expansion slot lets users add additional memory space as needed.



Moxa Solution

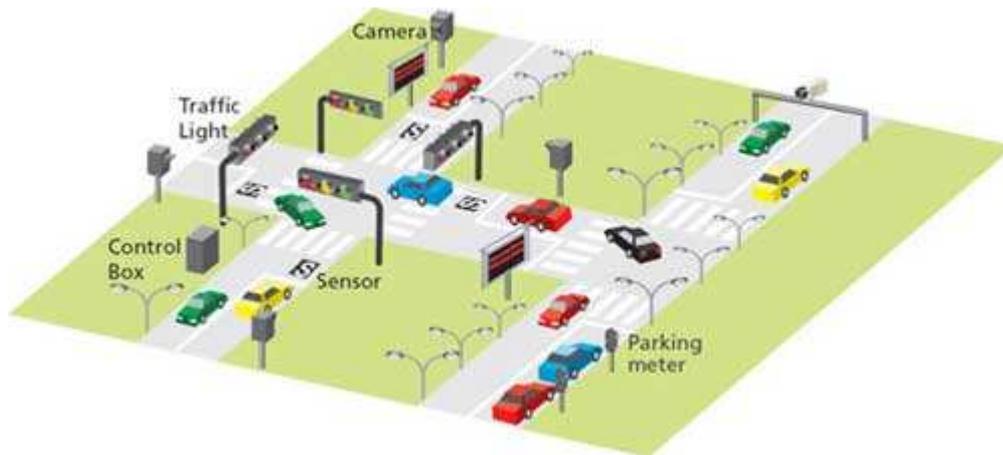
### **Traffic Control at Busy Intersections**

At busy intersections, IP cameras can be used to allow human operators to gauge the number of cars waiting at the intersection. The UC-7420 transmits the images over the Internet from the intersection to a remote monitoring center. Signals that control the status of each traffic light can also be transmitted from the UC-7420 to the monitoring center. For this type of application, the human operators use their traffic control experience to determine the best time to change the light from red to green to alleviate snarled traffic conditions. The strategy of placing a combination of IP cameras and front-end embedded computers at busy intersections around a large city can be used to create a city-wide traffic control system. Roadside LED displays can also be used to issue traffic warnings to motorists to avoid the most congested areas of the city.

### **Controlling Traffic at an Automated Parking Lot**

We've all had the experience of entering a large parking lot, only to drive aimlessly around the lot for several minutes before locating an available space. A combination of sensors and LED displays can be used to create an effective traffic control system that directs motorists from the entrance to the nearest empty parking space.

One option is to use sensors that automatically detect which parking spaces are occupied and which spaces are empty. The sensors can be connected to a UC-7420 through a local RS-485 network. The UC can be programmed to monitor the sensors continuously, and when a car leaves a space, this information is relayed to a central computer over an Ethernet LAN, or 802.11 wireless LAN. The UC-7420 can also be used to connect the LED displays to a central computer. The central computer monitors the information from all of the sensors in the parking lot, and when a car enters the parking lot, it uses the LED displays to direct the driver to the nearest empty space.



#### Why Moxa

- No fan, no hard drive design for longer MTBF
- CompactFlash slot for adding gigabytes of storage space
- Multiple connection options for greater networking versatility
- Programmability gives system integrators infinite possibilities