



## Electronic Parking Meters

Posted on Friday, March 05 @ 09:25:13 PST by [samc](#)

[Linux Devices](#) reviews wireless parking stations used in Montreal.



The City of Montreal is planning to roll out [500 to 800 wireless, solar-powered parking payment stations](#) based on embedded Linux. Each station replaces about 12 traditional parking meters. [8D Technologies](#) of Quebec, worked with parking equipment provider [Cale Systems](#) to develop the stations.



The meters run a 2.4.19 Linux kernel, and are networked wirelessly via GPRS. A low-powered ARM processor and a large reserve battery enable the stations to run on solar power, separate from both electrical and telephone grids.

Customers can pay or add time using coins or credit cards from any payment station in the city, provided they remember the parking spot identification code marked on the panel in front of their parking spot. After paying, they need not return to their car with a receipt.

Meter maids can cruise for violators using ruggedized Intermec handheld devices inside their vehicles. The devices have built-in city maps on which paid spots are green and unpaid spots are red.



Centralized control enables city officials to adjust rates on the fly, for example raising the rates during sporting events, concerts, or other times of high parking demand.

8D began with a parking payment station developed by parking equipment manufacturer Cale in the 1980s, replacing the device's motherboard with 8D's "ECO" device for wireless point-of-sales (POS) systems.

Integrating its POS technology with the existing device proved to be one of the challenges for 8D. According to CTO Jean-Sébastien Bettez, "We are a software company. We had to acquire expertise in this new hardware environment, to work with the buttons on the keypad and the card reader. We had to make it work the same as before, so users find no difference from the old one."



8D's ECO wireless POS device incorporates three boards. An ADS BitsyPlus serves as the embedded computer. An Atmel 8-bit AVR risc-based microcontroller handles data acquisition tasks. A third, customizable interconnect board provides the necessary interface ports, including serial, IrDA, PCMCIA, digital I/O, analog I/O, wireless WAN (GPRS), Serial Programming Interface (SPI), and One Wire.

The BitsyPlus is based on a 206 MHz StrongARM SA-1110 processor, along with an SA-1111 companion chip. It incorporates power-partitioning technology that ADS claims yields the highest "MIPS/watt" (Millions of Instructions per watt) available. The

board includes an interface for the CompactFlash device that the parking station boots from, along with 64MB of RAM.

EO Isabelle Bettez notes that 8D is exploring opportunities to deploy the Linux-based parking stations in several other cities, "including one in Europe." Isabelle Bettez notes that 8D is prepared to offer several features not included in the Montreal roll-out, including debit card payments, payment via secure Web page, and more.

[Cale Systems](#) was here in Portland a few weeks ago, promoting their GPRS interface as a money saver (See: [MAN with a Plan](#)). Portland's parking meters use CDPD-based Mobitex -- [which is going away](#).

Could the City of Portland might save time and money with a WiFi card in the PCMCIA slot? Multiply 1000 electronic parking meters times \$20/month. Then add another 1000 users of handheld/vehicular information systems scarfing down \$40-\$50/month in cellular EDGE/GPRS bills. Soon, you're talking real money. Why pay cellular operators \$50,000 every month?

It's a good rationale for building a WiFi cloud. Perhaps 4-5 units - using mesh networking - could share a single 802.16 backbone. Wi-Fi for everyone. Save \$500K/year in cellular bills (paid by you and I). Would it be safe, reliable and cost/effective? Test it and see.

DailyWireless articles on electronic parking meters and wireless clouds include [Death to CDPD](#) and [MAN with a Plan](#).