Amersam Car Park Management

TCM Enginy Uses Opto 22 SNAP Ultimate I/O-Based Machine-to-Machine System for Remote Monitoring and Data Acquisition at Parking Facilities in Reus, Spain

Reus, with a population of 100,000, is the largest city within the Baix Camp region of Catalunya, Spain and sits at the intersection of several freeways linking the cities of Barcelona, Valencia, and Tarragona on the country's northeast coast. Reus first gained importance in the 12th century for its agriculture and as a center of commercial trade in the Mediterranean area. Today, Reus shares the problem of many of Europe's historical cities, where a shift towards private transportation has dramatically increased the demand for public parking, creating a major problem for public administrators.

Amersam: The Car Park Management Company

Amersam is a privately-run consulting firm owned by the Reus City Council and specializing in the development and administration of public and commercial parking facilities and shopping malls. Active in Reus since 1988, Amersam was awarded a contract to manage the city's existing public parking facilities in 1994. Since that time, the company has constructed three additional underground public structures in the area. Amersam's success is largely due to the incorporation of standards-based technology in the installations they manage.

Among other benefits this provides are lower operational costs and a significant reduction in maintenance. By using the latest commercial technologies, including IP-based data, video, and voice, all of the Reus parking structures can be remotely monitored and controlled from any of their distributed control centers.

Application Requirements

All public parking facilities in Spain are required to maintain a host of general services and also monitor for fire, carbon monoxide, and other hazardous conditions. Typically, each of these

Figure 1: Interior of an Amersam parking facility

services and monitoring systems are supplied by a separate company, with bottom line price serving as the determining factor in vendor selection.

These vendors often deploy proprietary systems, which may vary from a wall mounted alarm panel to a PC running a custom software package. Remote monitoring may be offered but is usually part of an enhanced maintenance contract. Besides sourcing and overseeing the installation of each of these systems, parking facility administrators are also faced with the problem of trimming operational costs through negotiated discounts. Any markups or cost overruns are inevitably passed on to the end customer.

TCM Enginy: The Technology Consultant

Amersam's relationship with TCM Enginy, a leading technology integrator in Catalunya, resulted in a proposal to radically improve the operations and management of Amersam's parking facilities. The plan proposed the centralized management of all data from each parking facility and the distribution of relevant information across the enterprise to operations, maintenance, and executive management personnel. TCM Enginy's vast experience in information systems and telecommunications allowed the company to present a proven solution to Amersam.

Avoiding proprietary solutions, such as field buses and exclusive software packages, all sensors and monitoring systems in the Amersam parking structures are connected to Machine-to-Machine communication (M2M) systems from Opto 22 of Temecula, California, USA. Opto 22, a developer and manufacturer of hardware and software for automation, remote monitoring, and data acquisition applications, bases its M2M systems on its SNAP Ultimate I/O hardware. Unlike most programmable logic controllers (PLCs), which are sometimes used for M2M-type applications, SNAP Ultimate I/O is a programmable system with built-in Ethernet capabilities, allowing data to be accessed by or transmitted to any point on an Ethernet TCP/IP network.

Figure 2: Opto 22 hardware communicates with Amersam's facility systems via standard wired and wireless Ethernet connections.

"The fact that the Opto 22 hardware was Ethernet-ready was very attractive to us," states Antonio Biedma, TCM Enginy's engineering manager. "Networking a typical PLC requires purchase and installation of a separate Ethernet adapter card, which can cost upwards of $500 dollars apiece. For a large applications spread over multiple sites, costs can quickly spiral out of control and that's just not acceptable for us. The Opto gear, on the other hand, has a built-in Ethernet port. We just plug in the cable and we're connected."

Amersam's IT network is largely based on a fiber optic backbone, which the parking facility video systems and emergency phones connect to directly. Where wired connections are not practical due to location, hazardous conditions, or other factors, standard Wi-Fi wireless technology is used. Using these standard Ethernet and wireless technologies has enabled Amersam to avoid high installation costs and unnecessary middleware that might otherwise be necessary. Ultimately, whether wired

or wireless, once connected, networked software applications can send and retrieve real-time data from the SNAP Ultimate I/O unit using standard database technologies such as Object Linking and Embedding (OLE) and SNMP.

Individual Monitoring of Every Parking Space

At the Amersam parking facilities, a proximity sensor has been installed in each parking space, allowing individual monitoring of each one. These sensors communicate to the SNAP Ultimate I/O unit, indicating if a specific space is occupied or empty, timestamping the data, and sending it over Amersam's Ethernet network via SNMP to designated databases (see Figure 3). With this data now readily available, other parking-related information can be easily extrapolated and appropriate operational and financial decisions can be made.

Figure 3: An SNMP alert

"The parking space monitoring provides more information than you might think," attests Leonardo Blazquez, Amersam's IT systems manager. "Besides letting us know whether the space is occupied or not, we can also determine the duration of that status, whether a vehicle has exceeded normal occupation time, and detect unauthorized movement as well as possible abandoned vehicles."

"As a result, we have expanded and improved the services we now offer to our customers, and by defining and measuring the real use of our facilities, we can accurately predict demand levels and optimize services such as off-peak or overnight parking, prepaid discount cards offers, and monthly and long term parking."

Additionally, Amersam is using SNAP Ultimate I/O's control capabilities to operate display panels on each floor of the parking structure, indicating availability by dynamically zoning and identifying areas of many, few, or no parking spaces.

Monitoring and Control of Other Facility Systems

Knowing where vehicles are parking also gives Amersam management a better understanding of where pedestrians need access. By connecting facility lighting systems and movement detectors to the SNAP Ultimate I/O system, Amersam is able to exercise intelligent lighting control, saving electricity by reducing or shutting down lights in unused areas. Amersam ventilation, fire detection, and carbon monoxide detection systems are also monitored by the SNAP Ultimate I/O system, automatically detecting and relaying alarms to maintenance or emergency services personnel as needed. In this way, Amersam has consolidated most of its monitoring equipment into a single device.

The resulting reduction in operational costs has been passed along to customers in the form of lower parking charges. Other benefits include increased security as well as Amersam's ability to provide timestamped reports on all facility systems to fire inspectors, insurance inspectors, and regulatory agencies.

Through this higher level of automation and use of an IP-based network architecture, Amersam can monitor and control all of its parking facilities in Reus from a centralized control center. This means that it is no longer necessary to have all facilities manned 24 hours to avoid compromising customer service. "The resulting savings in staffing alone have more than justified the costs of installing and implementing the Opto 22 M2M technology," says Blazquez.

Adding Value to Customer Service

TCM Enginy, working with Amersam, has leveraged its new capabilities, enabled by implementation of the Opto 22 M2M technology, to solve specific customer service issues. A major complaint from users of the Amersam parking structures was that upon arriving at a location that was full, their only choices were to queue outside (with their car's engine and air conditioner running) or drive to another facility in hope of finding a space. With information on parking availability now residing on their network, Amersam decided to make the data available to the public via the Internet. With minimal software development Amersam and TCM Enginy created a Web portal that customers can access to check the status of all Amersam parking facilities.

Figure 4: Public information panels at street level connect directly to SNAP Ultimate I/O and display current parking availability.

With this information updated every minute, customers can use their home PCs or mobile phones to access data indicating the number of spaces currently available in each of Amersam's parking facilities, and even the demand trend for how quickly each facility is filling up.

"The benefits of this M2M communication, in this case, 'machine-to-mobile', are tremendous," says Blazquez. "First, customers avoid the time and stress associated with wasted trips to a car park that's already full. We're also greatly reducing queuing outside our facilities and the traffic congestion, spent fuel, and the vehicle emissions associated with it. This makes everyone happy, especially the city of Reus. Our investment in technology to improve the quality of customer service is proving profitable and ensures that car owners think of Amersam whenever they need to park."

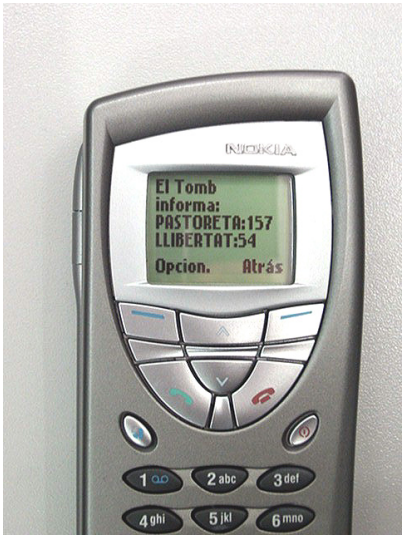
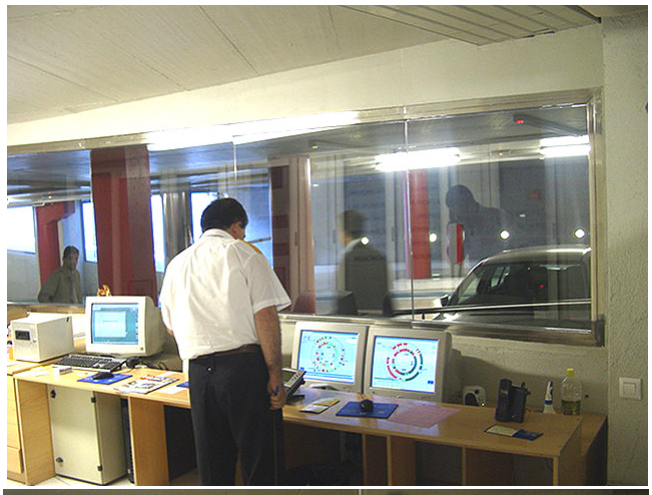
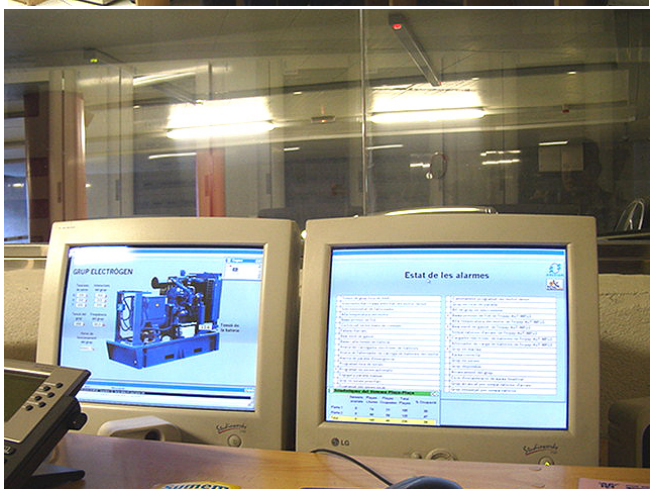


Figure 5: M2M communication: A Nokia mobile phone receives Amersam parking information via SMS messaging.

Finally, in addition to providing a major convenience to customers, Amersam is generating a new source of revenues for itself as an SMS service provider. When sending an SMS text message from their mobile phone requesting the parking data (and subsequently receiving a reply with that information), a minimal service charge is made to the user's phone bill. This fee is shared between the phone company and Amersam.





Figures 6 and 7: Amersam management remotely monitoring facility parking spaces and equipment.

Looking Ahead

Currently, TCM Enginy is studying the use of Radio Frequency Identification (RFID) devices and their ability to communicate with the SNAP Ultimate I/O system for the purposes of more specifically identifying vehicles and their precise locations within a parking facility.

Through the use of standard network technology and the possibilities offered by Opto 22 and its Machine-to-Machine technology for remote monitoring, control, data acquisition, and communications, parking management has now evolved from a lone employee handling tickets and manually controlling an access gate into a sophisticated, easily integrated and managed solution that's inspiring car parks in cities throughout Spain and Europe.

To view the secure TCM Enginy web portal and see real time reports on Amersam parking facilities, send an email to marketing@opto22.com.

About Opto 22

Opto 22 manufactures and develops hardware and software products for applications in industrial automation, remote monitoring, and enterprise data acquisition. Using standard, commercially available Internet, networking, and computer technologies, Opto 22's SNAP systems allow customers to monitor, control, and acquire data from all of the mechanical, electrical, or electronic assets that are key to their business operations. Opto 22's products and services support automation end users, OEMs, and information technology and operations personnel. Founded in 1974 and with over 85 million Opto 22-connected devices deployed worldwide, the company has an established reputation for quality and reliability. Opto 22 products are sold through a worldwide network of distributors, partners, and system integrators. For more information, contact Opto 22 headquarters at 800-321-OPTO or visit our Web site at www.opto22.com.