

Case Study Birmingham Airport



Oxford Automotive Technologies specialise in Energy Management systems and Lighting Control with particular emphasis on wireless lighting control systems.



Project File:

Client: National Car Parks

Design: Oxford Automotive Technologies

Electrical Contractor: South Eastern Electric



Background

OAT were approached in September 2005 by National Car Parks to design and develop a wireless network of PIRs linking into a control system that would operate the car park lighting only when the area is occupied. Multi Storey Car Parks are generally lit 24/7 even when they are closed and unoccupied and it was felt that energy savings could be significant if the lights could be turned off.

The Solution

OAT researched and developed the **Insight** Control System that comprises of a range of wireless PIRs, radio transceivers and relay interface units that are battery powered, extremely robust and have a radio range of up to 2 kilometres. The PIRs are all addressable and communicate to a receiver on each floor. This receiver then provides signals back to the main control system.



Control of the lights is effected by the **Oracle II** intelligent lighting controller that interprets the signals from the Receiver (INSR8OUT) and interfaces with existing contactors within the floor distribution boards. The **Oracle II** Controller is fully programmable to operate zones of lights according to the sensor that has been operated, Once a sensor is activated, the controller operates the required zone of lights for a period of ten minutes (adjustable). A separate input for a wireless photocell also enables perimeter lighting to be disabled in the daytime thus creating more opportunities for energy saving.



The system is designed to be fail safe such that should the controller, receiver or one of the sensors fail, the lighting for that floor will turn on. A commissioning mode allows quick set up and testing of the system



The system was installed at Birmingham Airport short stay multi storey Car Parks 1 and 2 where the PIRs were positioned to cover the incoming barriers, all up and down ramps and all pedestrian exits. The Electrical Contractor had installed a new distribution board on each floor of the Car Parks to feed the lighting circuits. OAT positioned the **Oracle II** Controllers adjacent to the new switch boards and wired into the control circuits to operate the lighting contactors. The receivers were positioned in the floor areas to guarantee reception from all of the PIRs.



In all there were 52 sensors, 10 receivers and 10 **Oracle II** controllers fitted to the car parks allowing each floor to be split into two levels.

The Results

Installation of the control system allows the Car Park lights to operate only as a vehicle or a pedestrian enters a particular floor or zone. The perimeter lighting is operated by a photocell that turns these lights off during daylight hours. The effect of the control system is immediately visible even during the day at a busy car park such as Birmingham Airport with the top two floors of the car park often being off. Night time periods are more spectacular with the entire car parks in darkness until a night flight arrives and travellers return to their vehicles. The benefits of the system are twofold with energy conservation being the priority, however due to the operation of the system, light pollution is also greatly reduced.

Following installation of the **Insight** Control system, Birmingham Airport Car Parks 1 and 2 are saving 46% of their energy compared to the previous months. This equates to a saving of £7000.00 over two months with a return on investment of just over one year. In addition to this the system is eligible for enhanced capital allowances of 100% allowance for the entire installation in the first year, thus reducing payback periods even further.

These resultant savings have led NCP to install the **Insight** control system on a further 13 projects in the Birmingham and Leicester areas with a roll out planned in other cities.

