CASE STUDY

LORD OF THE BULLRING

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The uncomplicated design of the Trend building management system supplied by Robell Control Systems for Birmingham's new Bullring retail development is in sharp contrast to the complexity of its wide-ranging control and monitoring functions. Using some 150 small but powerful Trend IQ controllers, Robell has created a highly distributed system architecture that is simple and flexible, and facilitates ease of maintenance. As well as helping to ensure shopper comfort and safety, the £1.3 million BMS keeps a tight rein on energy consumption. It also proved an invaluable aid during commissioning of the HVAC services.

The £500million Bullring complex is among the biggest inner-city shopping developments in Europe. A combination of covered malls and open walkways give access to 110,000m^2 of retail space on three levels – the whole development being effectively bisected by a new pedestrianised street. Beneath the shops are two car-parking floors and an area housing services and a management suite. The malls are topped by a spectacular 7000m^2 'skyplane' glass roof.

The extensive heating, ventilation and air conditioning plant and equipment that serve the malls, car parks and back-of-house areas are tightly controlled by the Trend BMS, as are the innumerable luminaires that provide lighting in these zones. In addition, the system monitors the life safety systems, all lifts and escalators, disabled toilet alarms, and the site's four electrical sub-stations, as well as metering power and water consumption. It has also been configured to perform a load-shedding routine should a sub-station's main transformer go down (which would result in a smaller, standby unit taking over).

Conditioned air for the malls and other areas is supplied by 26 roof air handling units, each equipped with a gas-fired burner unit and a 6-stage DX refrigeration package. Every AHU has a networked IQ controller, this being in a panel that has actually been integrated into the plant. Robell and the development's building services consultant WSP saw a number of advantages in having small, dedicated controllers local to the plant, as opposed to using large outstations that would each control a number of AHUs. Most obviously, it greatly reduced the amount of field wiring. Moreover, when some plant had to be moved from its original position to provide room for tenant services, extending the network cable was the only change necessary. Also, the cost of maintenance is minimised, as is any consequent disruption.

The lighting is switched according to adjustable time schedules for each of the various areas. In the malls, the control regime also takes account of outside light levels, as measured by sensors on the glass roof. The object here is to maximise the use of natural lighting, and thus minimise the energy needed to maintain optimum illumination. In the back-of-house areas, 50% of the lights are switched

off outside normal hours, the luminaires that are kept on being rotated each week. In the car parks, a third of the bay lights are turned off when the centre closes and the rest an hour later. (The one-third switched off first is changed every week.) External lighting is brought on automatically when darkness falls and is timed off at 3.00am. As in the case of the air conditioning, the controllers are highly distributed.

In the event of a fire, the BMS would monitor the status of all fans and dampers that are part of the smoke containment/clearance strategy. Through its graphical user interface (GUI), the firefighting personnel would get a clear picture of what is going on.

The GUI is Trend's new 963 supervisor. Its main users are the Bullring's facilities manager – who employs it both for monitoring and adjusting control settings – and the building services maintenance contractor. The supervisor links to one of the four interconnected LANs on which the IQ controllers are distributed.

Installation of the BMS was completed on schedule in May 2003, giving Robell sufficient time to fully tune the controls before the Bullring's opening in September. During this same period the supervisor was also used to assist fault-finding and commissioning of the plant the system controls.

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