

CASE STUDY

COLLEGE AIMS TO BECOME TOP OF ITS CLASS

The newly opened £27million Hillsborough College in Sheffield is expected to boast energy efficiency levels that will be the envy of most other further education establishments. A building management system designed and supplied by Trend will play a central part in preventing unnecessary energy usage, one of its key functions being to provide room-by-room control of heating based on actual occupancy. Hillsborough is part of The Sheffield College, whose other main sites also feature Trend systems; these are managed and monitored, via the city-wide college intranet, from a Trend central supervisor, as will be the new building's BMS.

The Sheffield College ranks as one of Europe's largest further education colleges. Trend systems are to be found in all of the properties that it owns across the city, which comprise its four principal sites and five smaller premises. The first was installed in 1989. These systems have made an important contribution to the college's impressive energy savings record, particularly by providing independent time control of heating in different building areas. In the last four years, energy consumption across the estate has been cut by 25%.

While the energy performance of Sheffield College's older buildings is above average for the sector, that of the new Hillsborough site will be on a par with the very best. The building's design and that of its services – including the extensive use of natural

ventilation/cooling and underfloor heating – will serve to severely limit energy consumption. So too will the control strategies implemented by the BMS, which will ensure that the operation of the H&V services are very closely matched to demand. To this end, the system employs over 100 presence detectors to monitor classroom occupancy.

In addition to a dedicated sixth form centre, Hillsborough College offers a wide range of vocational and adult training courses. Its state-of-the-art facilities include art and design studios, ICT workshops and science laboratories, plus a learning resource centre, refectory and large fully-equipped sports hall. The building itself essentially comprises a 3-storey, glass-topped central 'street', connected to which are four 'avenues'.

Two of the latter have a double-fronted glass façade, one effect of which is to greatly reduce heat loss.

To meet the needs of different areas, a variety of heating and ventilation plant has been deployed, all of it closely controlled and monitored by the BMS. Though a large part of the building – including the main street, refectory and LRC (learning resource centre) – has underfloor heating, most of the numerous classrooms have natural convector heaters, some with fresh air inputs. Radiators provide the other main form of heating. Serving these various systems are three boilers (one lead, two standby) and five hot water circuits (four constant temperature, one weather compensated).

When temperatures exceed pre-set limits in the central street, stairwells, sports hall, management suite and



LRC, cooling is provided by the BMS opening louvers and windows (or in the street, atrium rooflights). The system incorporates a Trend weather station and stops windows opening should it be raining or if the wind speed/direction is unfavourable. During hot spells it also operates a night cooling strategy.

Some areas are served by air handling units with heater batteries and DX cooling, though these operate in a very energy efficient manner. Heat is reclaimed by means of a thermal wheel arrangement and the units' supply and extract fans are controlled in accordance with demand by Trend NXL variable speed drives.

During college occupancy hours, the BMS switches a classroom's heating to a setback level if the room's Trend ultrasonic motion sensor detects that no one is present. Occupation time schedules have been set up within the system to switch the H&V services on and off as required. Trend has built considerable flexibility into the controls so that the heating in different parts of the college can be operated independently, allowing for their disparate patterns of use without wasting energy.

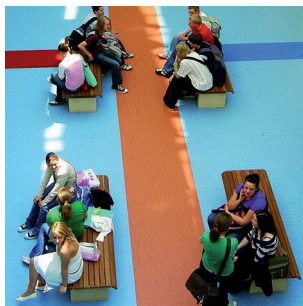
System control and monitoring functions are performed by 65 Trend IQ intelligent outstations that connect to four, interlinked local area networks. Most are wall-mounted units distributed around the college, each of them generally controlling two rooms. The remaining IQs are in control panels in the plant rooms. Each panel is fitted with a simple-to-use IQView touch-screen operator interface that allows access to the system locally.

Accessing monitored data and adjusting control settings will mainly be carried out from a Trend '963' supervisor in Sheffield College's Estates Department, which is at its Castle site in the city centre. The '963' communicates with the Hillsborough building, and most of the other Trend sites, over the college's Ethernet-based wide area network. The supervisor's client/server structure allows multi-user access from essentially any PC.

One task that the supervisor is used for is setting up the buildings' occupation times, which is done a whole year in advance. These time schedules are easily changed to allow, say, for unscheduled evening events. The supervisor also receives all alarms, any

critical ones (such as a boiler failure) being automatically re-transmitted as an SMS text message to the mobile phone of Sheffield College's Energy Manager, Peter Kelsey and/or one of the other Estates Management team. Mr Kelsey is also equipped with a Trend '916' display, which runs on a hand-held PDA; built-in Bluetooth technology enables wireless connection to his mobile, which can then dial into any of the Trend systems via the GSM network. This facility enables him to interrogate a system wherever he happens to be. On one occasion he has even used it to change the temperature in a college building while on a fishing trip to Whitby!

The building services consultant for Hillsborough College was Hoare Lea & Partners. J F Finnegan was the main contractor and NG Bailey the M&E contractor.



Trend Control Systems Limited

P.O. Box 34, Horsham, West Sussex, RH12 2YF, UK.

Tel: +44 (0)1403 211888 Fax: +44 (0)1403 241608 www.trend-controls.com

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