

**KNX Association**

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## SciTec New Construction of the Oundle School Peterborough

Significant Reduction of Energy Consumption and CO<sub>2</sub> Emissions with KNX



Picture 1. Energy Efficiency 1: Demand controlled lighting with KNX in the laboratories.

The renowned Oundle School is a boarding school and day school at the same time. Approximately 240 day school students and 820 boarding school students, ages ten to nineteen, are taught at the private school. The school buildings, some of which are from the 17th century, are scattered in the market town of Oundle about 120 km from London. SciTec is the first new construction for the school in this century and provides room for sciences, arts, design and technology. The project is a showcase of an energy efficient building which utilizes

the best possibilities with regards to the controls. The building itself should be a tool for the development and understanding of sustainability.

Andromeda, who was the system integrator for the entire building automation system based on KNX, estimates an energy reduction of 40 – 60 % as compared to conventionally controlled schools. Just the demand controlled lighting system reduces the CO<sub>2</sub> emissions from 8 million to 2.8 million tons per year!

### Benefit of KNX for this Project

- Highest energy efficiency and significant reduction of CO<sub>2</sub> emissions with demand controlled systems
- Reduction of installation costs and therefore reduction of gray energy with KNX in every room for all trades
- Integral operation and visualization of all sub systems over a single building management system, on every PC internally or externally, thanks to the web-based technology

**Project-Nr.: Z1-08-D**

Country: Spain

### Type of Building

- RESIDENTIAL
  - Single Family Home
  - Apartment Building
  - Senior citizen home
  - Assisted living
- COMMERCIAL
  - Office / Public Administration Building
  - Business
  - Entertainment (Cinema, Theater, Museum, etc.)
  - Health Care
  - Educational (School, University, etc.)
  - Recreational (Sport, Wellness, etc.)
  - Industrial
  - OTHER

### Trade / Systems

- Lighting
- Shading / Daylighting Control
- Heating, Ventilation, Air-Conditioning
  - Household appliances
  - Alarm Systems
- Monitoring
- Energy Management System
  - Smart Metering
  - Audio/Video
- Visualization
- Interface to other Systems
- RemoteControl and Administration
- Other Application

### Size

- Number of Areas / Lines: 1/4
- Number of KNX Devices: 190 and HVAC



**Picture 2. Energy Efficiency 2:** Lots of daylight and presence sensors for the lighting system.



**Picture 3. Sustainable Energy Sources:** Solar collectors for domestic water heating.

## Single Sourced for High Energy Efficiency

The determining factor for awarding the contract to Adromeda was the capability of KNX to combine all trades into a single system that will allow high energy efficiency and reduction of CO<sub>2</sub> emissions. KNX therefore reduces costs, labor and materials.

KNX controls the natural ventilation which already saves 78% of the energy as compared to a conventional mechanical ventilation system. The natural ventilation was implemented with automatic windows and a mechanical ventilation system with minimum fresh air which is controlled by air quality sensors. The radiant floor heating system is controlled in 16 zones and saves 50% of the energy as compared to a conventional heating system. The hot water is entirely heated by solar collectors on the roof in the summer, and in the winter the water is pre-heated by solar energy.

The lighting system is daylight controlled with additional presence sensors to a constant value of 400 lux which provides an energy reduction of 60 – 70 % as compared to a manually switched lighting system. All luminaries are controlled by DALI/KNX gateways including the emergency lights. The photovoltaic system covers part of the energy consumption of the lighting system.

### **An Integrated System with KNX as the Basis**

All trades are controlled by KNX via gateways with DALI. All sub systems are integrated via KNX/IP gateways into a single integrated system. The web-based building management system allows the control and parameterization, as well as part of the energy monitoring. This integrated and clearly arranged system enables the facility management team to run the building safely and optimized with regard to comfort, energy efficiency and CO<sub>2</sub> emissions.

## Sophisticated Features

- Integration of the decentralized, energy optimized heating and ventilation systems with components like dampers, valves, zone controllers, window motors, etc. via KNX.
- Integration of all KNX controls via KNX/IP gateways into the web-based building management system for an optimized overall energy efficiency and easy management for the school's facility management team.

## Involved Parties

### **Owner:**

Oundle School, Peterborough, United Kingdom

### **Architect:**

Fielden Clegg Bradley, London, United Kingdom

### **Electrical Engineer:**

Max Fordham, London, United Kingdom

### **M & E:**

Briggs & Forster, Northampton, United Kingdom

### **KNX system integrator:**

Andromeda Telematics Ltd, Byfleet Surrey, United Kingdom



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## Award



**KNX Award 2008**  
 Category  
 Energy Efficiency