

## High Energy Efficiency for Homes with KNX

### Increase in Comfort and Security



Figure 1. Single family home in Puidoux with high energy efficiency due to KNX

DOMO Energie not only applies intelligent building systems to increase comfort and to provide luxury, but also focuses on improved energy efficiency of homes (the source of half the total CO<sub>2</sub> emissions). DOMO facilitates the application of modern technology to effectively reduce energy costs and environmental impact and to create additional value in a building. The EU energy pass that is currently being introduced will also become important for Switzerland.

The new single family home in Puidoux at the Geneva Lake in the western part of Switzerland has a total living area of 340m<sup>2</sup> (heated area of 253m<sup>2</sup>) over three stories. DOMO Energie applied KNX to increase comfort and security and to reduce the thermal energy demand by 48% and electrical energy demand by 40%. Most of the electrical energy savings are achieved by automatic lighting controls through motion and light sensors.

### Benefits of KNX for this project

- High energy savings and amortization of the necessary installation costs within 5 years (approx. 1200 Euro energy cost savings just for thermal energy)
- Operation of all the building systems through a central visualization system
- High comfort – e.g. for lighting scenes
- Presence simulation and camera surveillance
- Flexible, easy and cost-effective expansion possibilities

**Project Nr.: W3 / 06 / D**

**Country: Switzerland**

### Type of Building

- **RESIDENTIAL**
- Single Family Home
- Apartment Building
- Apartment
- Other
- **COMMERCIAL**
- Office / Public Administration Building
- Business
- Sales
- Hotel and Restaurant
- Entertainment (Cinema, Theater, Museum, etc.)
- Health Care
- Educational (School, University, etc.)
- Recreational (Sport, Wellness, etc.)
- Other
- **PUBLICITY**

### Trade / Systems

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

### Size

- Number of Areas / Lines: 1/4
- Number of KNX-Devices: approx. 68



**Figure 2.** KNX multi functional operating panel in the rooms: temperature sensor, display, button for lights and shading, LED display



**Figure 3.** The radiator of the staircase is controlled by a KNX valve and also functions as a handrail.

## Individual Room Control and Daylight Controlled Lighting

The energy efficiency for thermal energy is the focus of this project. The central heat is provided by a wood pellet furnace to encourage sustainability through the use of indigenous renewable energy sources. Every room is equipped with a multi-functional operating terminal with a temperature sensor and LCD display which also houses the individual room controller for the heating system. The display shows temperature values and the buttons are used to control lights, the shading system, and individual temperature control. The "present" / "not present" function changes the temperature set point from comfort to standby. The standby temperature can also be set centrally to reduce the

room temperature. The opening of windows will also lower the temperature set point of a room.

Three daylight sensors deliver three threshold values for the automatic lighting control system which works for ceiling mounted lights as well as for stand and table lights. Depending on the threshold value, the light gets turned off or the manual ON switch is suppressed. Additional groups of power outlets can be controlled by a timer to avoid other unnecessarily wasted electricity. Automatic lighting scenes for lights and shading system like "Good Morning" are available for several rooms.

### Up to date with KNX

All entrances, the garage door and windows are monitored. Individual states are displayed via KNX on LEDs. These

## Sophisticated Features

- At night: blinds close fully and lighting is set to user defined lighting level
- At dawn: automatic opening of the blinds and addition of artificial lighting
- During the day: reduction of artificial lighting through outdoor light sensors until certain sky luminance is reached, where lights are then turned off fully

## Involved Parties

### Owner:

B. Venditti, CH-1070 Puidoux

### Architect:

Artico Réalisations Sàrl,  
CH-1052 Le Mont-sur-Lausanne

### Electrical Engineer:

J. Besson Sàrl, CH-1510 Moudon

### KNX system integrator:

DOMO -Energie,  
CH-1052 Le Mont-sur-Lausanne

12 LEDs are located in the rooms below the KNX multi-functional operating panel and give an overview of the states with green and red lights. Open windows are reported by the visualization with floor and location. The easy to use visualization gives an overview of all the functions that are available to the owner. The presence simulation adds additional security if the homeowners are away.



### KNX Association

Bessenveldstraat 5  
B - 1831 Brüssel-Diegem  
Phone: +32 - (0) 2 - 775 85 90  
Fax: +32 - (0) 2 - 675 50 28  
E-Mail: info@konnex.org  
Web: www.konnex.org

Anfragen an die Redaktion:  
Inquiries to the editorship:

**Redaktion KNXJournal**  
Lüdersstraße 10  
12555 Berlin  
Germany

### Telefon / Phone

+49 - (0) 30 - 64 32 62 79  
+49 - (0) 30 - 64 32 62 78  
E-Mail: knx-journal@konnex.org  
redaktion@knx-journal.com  
Web:  
www.konnex.org/news/journal

## Awards



**KNX Award 2006,**  
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