

## Efficient and Intelligent with KNX



Figure 1. Single family home with low energy standards

**The control of environmentally friendly heating technology with KNX turns out to be a key factor for profitability.**

**Efficient heating systems like the heat pump are further optimized through KNX.**

A single family home with low energy standards was implemented with KNX technology by Riwitec from Innsbruck. The building is a residential home with a gross area of 150m<sup>2</sup> that was constructed to meet the lowest energy standards (figure 1). Numerous functions were implemented with KNX:

- Lighting control
- Shading control
- Heating, air-conditioning and ventilation control
- Data monitoring
- Energy management
- Visualization
- Interfaces to other systems
- Remote control and data logging

**Heating costs of 300,- € are possible**

The building owner had a clear idea of what he wanted from the beginning. He wanted to invest into a modern, comfortable and energy saving technology that would stand the test of time. It was important to him to have central control functions and a heating control system that would allow standby operation. The expandability of the system with audio and video control was also one of the customer's demands, along with access control of certain areas with visual display, automatic sun shading control, the individual room temperature control of the radiant floor system and a controlled ventilation system.

The yearly costs for heating of this 150m<sup>2</sup> home are incredibly low; between 250 to 300 Euros.

**Optimized Control of Environmental Energy**

The south-facing facade is an important characteristic of this home. It helps to reduce the heating demand in the winter but demands a good shading system during the summer. Depending on the

time of the year, there are solar gains for up to 14 hours a day. The building is heated with an air/water heat pump, which is directly connected with KNX, and heat storage within the floor slab (figure 2). The heating system not only provides the ventilati-



Figure 2. The integration of the air/water heat pump into the room ventilation controlled via KNX is the basis for the low energy demand



Figure 3. Meteorological station from Theben

on, but also the domestic warm water heating and the heating supply. A cross flow plate and frame heat exchanger recovers 90% of the energy from the mechanical ventilation system. The challenge for the KNX control

system was the interaction between the shading and the heating system. The low heating energy costs of this building could only be reached through the smooth interaction of these systems.

### KNX joins Trades

The lighting, shading, heating, ventilation and cooling system functions are integrated with KNX products. Dimming and switching actuators were used for the lighting system and were installed in subdistribution cabinets. Lighting scenes can be accessed via push button sensors, touch panel or PC. The sun tracking and temperature controlled shading system control is ensured with a weather station by Theben (figure 3). The control of the blinds into the lighting scenes and the presence simulation are included. The individual room control can be set to comfort, standby, nightreduc-

tion or party mode.

The radiant floor heating system covers the base load of the heating system. Push buttons sensors with integrated room thermostats were used. Actuators from Theben were chosen for the radiant floor heating system. The Gira Homeserver provides an interface to the Internet which allows the use of Email and SMS functions for the building control system. The access control and the visualization of the system was implemented with the Homeserver.

A multi-room system for audio control was prepared.

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