

Multifunctionality in Community Center

Energy consumption for town and citizens made transparent

Winner
KNX Award 2010
Category
National



In this public building, energy consumption was optimized with the help of KNX functions, and a visualization informs the public about the achieved energy efficiency

It sounds like a fairy tale: 'Wolkenrasenplatz in Sonneberg!' (Cloud lawn in sunny mountain). However, this project in the Thuringian town is actually real – including its energy-saving building technology which is controlled via KNX. The Wolke 14 multifunctional community center in Sonneberg in Thuringia is intended to promote shared activities between the young and the old in the Wolkenrasen district. The center was built by the local council in cooperation with the Protestant church and provides rooms for cultural and sporting events, such as a multi-purpose hall, workshops, a computer room, a prayer room, a meeting room and the pastor's apartment. As the whole project was part of a project study, particular emphasis was placed on sustainability, energy efficiency and flexibility. After all, such public buildings should also serve as an example when it comes to climate protection and careful use of resources. For example, the energy for space heating and hot water is derived from the groundwater using two heat pumps. The heat is distributed through a low-temperature under-floor heating system. The room temperature is controlled individually in each room using the KNX facility. A touch screen in the foyer of Wolke 14 is used for controlling the

building technology functions, and its visualization informs the public about the energy-saving functions in the building.

Many different use patterns for lighting, heating and solar screening

What is impressive about this relatively small KNX installation is that the building services in this public building can be used for a range of different functions. As the building is used by a number of different organizers, automatic controls were called for in order to save energy as well as man-hours. In addition, the building automation was intended to facilitate the operation of events, make consumption figures and accounting transparent and provide the necessary security. For this purpose, KNX controls lighting systems, solar screening, HVAC installations, alarm systems, media technology. It also records consumption data, sends fault messages and can be maintained remotely. A Gira Facility Server was installed for central visualization and control.

Most of the lighting is controlled manually, but presence sensors make sure that the respective lighting circuits are switched off automatically after a pre-set time. A weather station and the Facility Server organize the automatic solar

screening, including safety functions during stormy weather and security when the alarm system is set. During normal operation it can also be operated manually. There are 28 individual room controls; the target values and the time of day when the temperature is dropped from the comfort level to nighttime temperature can be pre-programmed via a time programme. In summer an automatic night cooling function (passive ventilation) ensures a comfortable room climate.

Monitoring and information

The complex security system also uses the KNX facility: internal room monitoring via KNX presence sensors and external monitoring via an IP access control system are both connected to a KNX alarm center. When an alarm is triggered, it is shown on the visualization display and is automatically relayed to a security company. Likewise, KNX is used to record consumption data. This data can be accessed by the contracted company via VPN, using the Facility Server.

The heart of the system is the Facility Server with its main computer. The visualization can be accessed from the touch screen and personal computers. The menu has pages leading to the different rooms and services to provide central switching of lighting, setting of target values etc.

However, the general public is probably most interested in the start page. It shows a schematic of the heat pump system with flow and return temperatures, the consumption of electrical energy and the resulting heat energy – an easy-to-understand illustration of modern building technology.

Benefits provided by KNX in this project

- Automatic functions for comfort levels and for the support of events
- Energy conservation through individual room control and automatic lighting control.
- Transparent consumption patterns to promote energy consciousness.
- Exact data for cost accounting relating to events by different user groups.
- Alarm function for technical faults and break-ins.
- Flexible building services to ensure that the multi-functionality of the building can be maintained in the future.

Technical refinements

- Through the networking of the KNX and IP technologies it is possible to set the KNX alarm system via the transponder of the IP access control system. The command switches the presence sensors to monitoring function and, at the same time, closes any open windows.
- In order to save energy, the presence sensors will automatically switch off the lighting in vacant rooms and areas and turn down the room temperature.
- For the control of the night ventilation facility, the Facility Server evaluates data for internal temperature, external temperature, set minimum value, timing program and switch over from manual to automatic.
- Consumption data is recorded and can be called up remotely.

Companies involved

Building owner:

Sonneberg Town Council
D-96515 Sonneberg

Services engineers:

Thomas Röthig, D-96472 Rödental, www.ksr-ingenieure.de

Electric installations:

Elektro-Sonneberg eG,
Sonneberg

System integrator:

Bert Schumann, Gebäudesystemtechnik Schumann, D-99091 Erfurt