

The Worldwide STANDARD for Home and Building Control



KNX Award 2008

Category: Young

Winner: HTS St. Pölten (Austria)

Building control at fire station optimises emergency response – young electricians put their trust in KNX

As their final technical exam, two Austrian electrical engineering students from HTL St. Pölten [St. Pölten Technical College] were given the opportunity to carry out a challenging programming task for the KNX system at the new fire station in Obergrafendorf. The system features sophisticated connections, and serves to increase safety in emergency situations. Thanks to their work on this project, the students were the deserving winners of the KNX Award 2008, category: Young.

In 2004, as the old fire station in Obergrafendorf no longer met the relevant requirements, the local authority took the decision to build a new one. Numerous planning meetings were held, in which new criteria were drawn up and transformed into concrete plans. Construction began in 2005, and the building was completed and ceremoniously opened in September 2006.

Trainees use KNX to fulfil demanding tasks

The large number of higher-level functions involved and the need for integration of all technical facilities, ease of operation and automated functional processes meant that a building engineering system with a bus system was required, but it was also important that the specially-trained volunteer firemen and -women should be able to extend the system themselves if necessary. The decision was taken to use KNX due to its complete standardisation, the extensive range of equipment on the market, and the fact that the system can be serviced by those fire brigade members who are also KNX partners.

Thanks to close contact between the designers/planner and the fire brigade, two students from the Department of Electrical Engineering at HTL St. Pölten were given the opportunity to take their final technical exam in the form of a practical task spread over several months. In November 2005, Christian Thallauer and Martin Ringseis – both fire brigade members themselves – together with their supervisors, Dipl.Päd.Ing. Gerhard Hinterhofer and Dipl.Päd.Ing. Gerold Mayerhofer, started work on compiling functional specifications, implementing the various planning requirements, revising the equipment list, and ultimately programming the KNX system. The new building was commissioned gradually, from spring 2006. Both of the students performed impressively and programmed the system to the complete satisfaction of the fire brigade, which earned them both an excellent pass in their final exam. The visualisation was implemented by engineer Herbert Hauber from the company Risk Control.

All of the technical systems regulating the building and the fire-fighting equipment are controlled and administered via KNX. The link to the wireless siren control system in particular ensures an optimum response in case of alarm. When the internal fire alarm system is activated or an intrusion or a technical defect is

detected, SMS and e-mail messages are dispatched to the responsible individuals in order to guarantee a quick response. The integration of a fingerprint and magnetic key access system into the controller for the building engineering systems makes for exceptional ease of operation.

Processes automated via KNX ensure a high level of safety and security

The link via KNX to the wireless siren control system allows automation of the following processes in an emergency situation:

- Immediate bright illumination of the building and the outdoor area
- As soon as the first fireman arrives and enters the building via the access control system following activation of the alarm, the fire engine bay doors are opened (depending on the temperature), and the exhaust extraction system is started up
- The air heating system for the changing rooms switches on, and all heating circuits are switched to comfort mode
- All technical equipment including siren system, emergency power generator, hose tower, heating, ventilation, etc. is monitored via the central touch pad and PC visualisation (Facility Pilot)
- Control of the battery charge indicator for the emergency vehicles

The building locks itself automatically if it has not been occupied for 15 minutes and was not locked from the central switch. Remote diagnosis and remote control are possible via the visualisation.

Integration of KNX for efficient automation and operation

The lighting is controlled via KNX sensors (dusk/dawn- and movement sensitive), from the central touchpad or incident control system, or via the link to the alarm system. In the training rooms, the lights are dimmed according to predefined lighting scenes. In the recreation and training rooms and the incident control room, the blinds are controlled via safety functions from the KNX weather station; in the training rooms they are automatically lowered in order to darken the room in the daytime for video presentations; and all blinds are raised centrally in case of emergency or when the burglar alarm is triggered. The skylights in workshops and in the corridor area are automatically closed via KNX in case of rain or wind, or when there is no one in the building. The base load heating system uses underfloor heating in the offices and recreation and training rooms, but the radiators in the various rooms can be controlled individually via KNX room controllers.

All fault and status messages received from technical equipment such as the heating and ventilation systems, the emergency power generator, the hose tower and the burglar and fire alarm systems are displayed and processed on the central touch pad and in the visualisation. The integrated KNX alarm system is linked to the lighting system and blinds and also allows notification of alarm incidents to be relayed, via visualisation, by SMS and e-mail to the responsible people. Visualisation presents the floor plan for the entire building on 7 different pages. All fault and status messages are integrated into this, and individual trades can also be controlled from visualisation.

Parties involved:

Owner: Voluntary Fire Brigade, A-3200 Obergrafendorf, Austria

Architect: KWI Consulting & Engineers GmbH, A-3100 St. Pölten, Austria

Electrical design: KWI Consulting & Engineers GmbH, A-3100 St. Pölten, Austria

KNX system integrator: Students Christian Thallauer and Martin Ringseis, Department of Electrical Engineering, HTL St. Pölten, A-3100 St. Pölten, Austria

Info: HTL St. Pölten, Werkstätte Elektrotechnik, A-3100 St. Pölten, Austria, gerhard.hinterhofer@htlstp.ac.at

Box 1

Use of KNX in this project

- Link to wireless siren control system ensures an optimum response in case of alarm
- SMS and e-mail messages are sent to the responsible persons when an alarm is triggered by the internal fire alarm system or burglar alarm, or due to technical defects
- All of the technical systems regulating the building and the fire-fighting equipment are controlled and parameterised via KNX

Box 2

Technical highlights of this project

- When the first fireman arrives and is identified by fingerprint or magnetic chip, all doors are opened and the lighting and heating systems are activated. If the building is empty for 15 minutes, all entrances are automatically closed.
- When the fire engine bay doors open, the exhaust extraction system for the emergency vehicles is switched on. The battery charge level for the vehicles is likewise monitored via KNX.

Photos:



Figure 1. View of the fire engine bays in the new Obergrafendorf fire station. Source: HTL St Pölten



Figure 2. Thanks to the networking of the various trades, the doors are opened and the lights switched on via fingerprint access control. Source: HTL St Pölten



Figure 3. With the help of a visualisation showing all of the systems, fire brigade members have a reliable overview of systems and can operate them easily. Source: HTL St Pölten



Figure 4. The new fire station at Obergrafendorf: fully automated and monitored with KNX. Source: HTL St Pölten

KNX Association is the creator and owner of the **KNX** technology – the worldwide STANDARD for all applications in home and building control, ranging from lighting and shutter control to various security systems, heating, ventilation, air conditioning, monitoring, alarming, water control, energy management, metering as well as household appliances, audio and lots more. **KNX** is the worldwide STANDARD for home and building control with a single, manufacturer independent design and commissioning tool (ETS), with a complete set of supported communication media (TP, PL, RF and IP) as well as a complete set of supported configuration modes (system and easy modes). **KNX** is approved as a European (CENELEC EN 50090 and CEN EN 13321-1) and an International standard (ISO/IEC 14543-3). This standard is based upon more than 18 years of experience in the market including its predecessors, EIB, EHS and BatiBUS. Over 140 member companies worldwide from different application domains have almost 7000 **KNX** certified product groups in their catalogues. The **KNX** Association has partnership agreements with more than 30,000 installer companies in 80 countries.

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For more information / material please contact:

heinz.lux@knx.org

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