

KNX STANDARDS

SMART BUILDINGS

An open standard, world-class building automation system

With increasing desire for more convenience, more safety and higher energy savings, the demand for building management

Whether in a single-family house or in an office complex, the requirement for comfort and versatility in the management of air-conditioning, lighting and access control systems is growing. At the same time, the efficient use of energy is becoming increasingly important.

However, convenience and safety coupled with lower energy consumption can only be achieved by intelligent control and monitoring of all products involved. While this implies more wiring, and in turn higher design and installation efforts, increased fire risk and soaring costs, the KNX Open Bus System eliminates all of the old-fashioned hard wiring to and from devices, allowing you to send all commands over the bus network. For example, only 24 Volt DC runs to all light switches, connecting them to the switch and dimmer actuators, in both the field and the distribution boards.

WHAT KNX DOES

In order to transfer control data to all building management components, a system is required that does away with the problems of isolated devices by ensuring that all components communicate via one common language, which the KNX system offers.

Furthermore, KNX is open standard, while other systems are proprietary. This standard is based upon more than 15 years of experience in the market with, among others, predecessor systems to KNX: EIB, EHS and BatiBUS. The KNX medium to which all bus devices are connected (twisted pair, radio frequency, power line or IP/Ethernet) enables the exchange of information. Bus devices can be sensors or actuators that serve to control building management equipment, such as lighting, blinds and shutters, security systems, energy management, heating, ventilation and air-conditioning systems, signalling and monitoring systems, interfaces to service and building control systems, remote control, metering, audio and video control, white goods and more. All these functions can be controlled, monitored and signaled via a uniform system without the need for extra control centres.

INTERNATIONAL RECOGNITION

One of the most important factors when creating a smart building is knowing that support is always on hand and that the system will not be obsolete in a couple of years time. With a KNX system, this is

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guaranteed, as KNX is the only smart home system that complies with the European and international standards for home automation.

The driving force behind KNX is KNX Association, a group of companies active in many fields of home and

building control. Currently, KNX Association has more than 120 members, accounting for more than 80% of the home and building control devices sold in Europe. As a common goal, these companies promote the development of building installation systems in general and KNX as the world's only open standard for home and building control. Worldwide, KNX Association has partnership agreements with more than 21 000 installer companies in 70 countries, more than 50 technical universities as well as over 100 training centres. KNX member companies offer almost 7 000 KNX certified product groups from different application domains.

KNX is approved as an International Standard (ISO/IEC 14543-3), as well as a European Standard (CENELEC EN 50090 and CEN EN 13321-1) and Chinese Standard (GB/ Z 20965). KNX products made by different manufacturers can be combined, as the KNX trademark logo guarantees their interoperability. Millions of successful KNX installations can be found all over Europe, in the Far East, North and South America and now, in South Africa.

ENERGY SAVING

Recent studies show that, typically, up to a 40-60% reduction in energy use can be expected by specifying KNX technology for your home. More than forty universities worldwide are involved with KNX and their scientific studies are an important key to understanding energy efficiency within the modern home. In one research project, conducted at Bremen University of Applied Sciences, two identical classrooms were selected as test rooms. One was fitted with a conventional installation, and the second with KNX control. Based on a four-year series of measurements, the use of KNX control was found to reduce energy consumption by an impressive 50%.

It is thus clear that the expenditure in building automation systems has a quick payback. Bremen University of Applied Sciences calculated that, with an annual energy consumption of 230 000 kWh for lighting alone, the investment of a KNX bus control would pay itself back after just one year. Ultimately, it is not just the owners, operators and investors who benefit from the reduced energy consumption – the climate does as well.

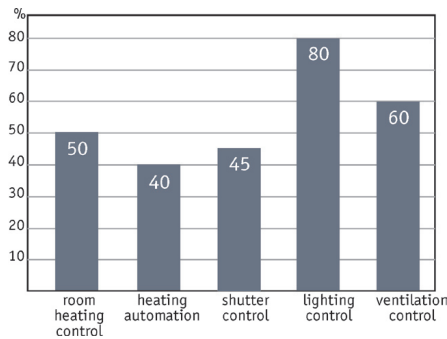
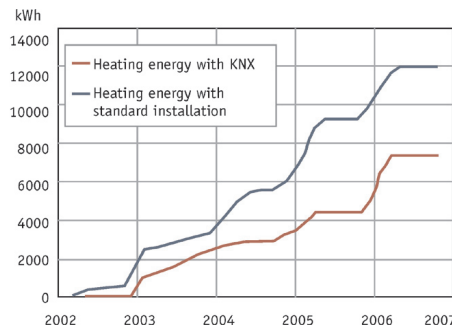
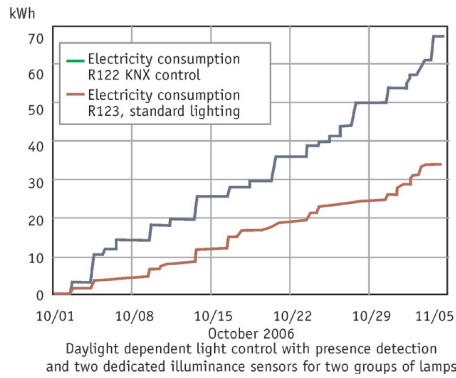
HOW IT WORKS

In an old-fashioned house, lights and other devices are operated via mechanical means. The switch or knob opens or closes an electrical

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connection or varies the resistance of that connection. In the smart home, the switch takes on a different function. Rather than regulating the flow of the electricity, the switch sends a signal to communication network, called a bus system, informing the smart home network that the button has been pressed. The smart home system then controls the electric circuits and systems, issuing commands to the various electrical systems to them what they need to do in response to the button press. This makes it possible for one touch control of the home. The beauty of this is that one button press can control anything hooked into the smart home network. In the KNX system, the intelligence resides in the products out in the field, and in the dimmer or switch actuators, presence detectors and watchdogs installed in the building, and you do not need a computer to maintain or run your system.

The programmer of the system creates one group address, for example, 1/0/1, for the first lever of a light switch. He can now 'drag and drop' that address onto as many circuits, switch actuators and dimming actuators as desired, which will switch these circuits on or off with one press of a button.



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This is especially handy in a panic switch application. Should you hear a sound at night, your bed lamp can switch all or selected light circuits on or off by pressing that one button. Should the programmer have created, for example, such a group address for an alarm system or security module, upon receiving a contact from any presence detector picking up movement from an intruder, or from a window or door magnet contact, apart from activating the alarm, which calls you and/or your alarm response company, the group address can send a command to turn on all lights in the building at once.

COMMERCIAL FEATURES AND BENEFITS

Energy management

- Peak demand monitoring
- Current detection
- Network monitoring
- Load shedding
- Metering
- Energy pulse counting
- Data logging
- Visualisation

Lighting control

- Switching and dimming
- Automatic lighting
- Constant light control
- Timed control
- Light scenes
- DALI gateway

Blind and shutter control

- Group and central control
- Preset positioning
- Sun tracing
- Automatic programs
- Climate enhancement
- Wind and rain protection
- Safety modes
- SMI gateway

Heating, ventilation and air-conditioning control

- Individual room control
- Central and automatic control

- Timed operation modes
- Safety programs
- Valve drive control
- Floor heating
- Fan coil units
- Electrical heating

Security and safety

- Intrusion and smoke detection
- Door access
- Preventive technologies
- Presence simulation
- Technical fault monitoring
- Supervision

Operation and visualisation

- Switches and/or push buttons
- Touch and display panels
- IR remote control
- PC visualisation
- Web servers
- WAP and PDA enabled

Automation and remote access

- Logical functions
- Timed functions
- System supervision
- Internet access
- Remote control and programming
- Messaging

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RESIDENTIAL FEATURES AND BENEFITS

Lighting control

- Central lighting controlled in the house and garden
- Choice of different lighting scenarios or individual dimming

Blind and shutter control

- Control of blinds and shutters with regards to wind, brightness and rain
- Control of blinds and shutters on a time schedule

Heating, ventilation and air-conditioning control

- Automatic and optimised temperature control according to room usage or the needs of the inhabitants
- Motorised window opening
- The ventilation system reacts to the presence of people in the room

Audio and video control

- Remote control of music from everywhere within the home
- Remote control for every room

Operation and visualisation

- Presentation and operation of all systems in the house via a wall-mounted display
- Easy visualisation and integration of audio systems and monitoring cameras

Security and safety

- Reporting of open or broken windows and doors, burglary, smoke emission, etc.
- Camera monitoring of the entrance
- Deterrence of potential break-ins by switching on the entire home lighting system (panic mode)
- Simulation of an occupied home through control of lighting and blinds set on a timer

ENERGY SAVINGS USING THE KNX SYSTEM

- Up to 40% with shutter control
- Up to 50% with single room control
- Up to 60% with lighting control
- Up to 60% with ventilation control

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BENEFITS OF KNX

KNX opens up new opportunities for building control systems, while keeping the costs at a manageable level. KNX can provide solutions that can only be realised with considerable effort with conventional installation techniques. Via a single touch panel, it allows new ways to increase comfort, safety and energy savings in a home or commercial building. The benefits that KNX brings to architects, designers, contractors and, above all, to building owners and users, include:

- **Low operating costs resulting in energy savings** Lighting and heating are only switched on when needed, thus saving energy and money. Furthermore, lighting can be controlled automatically in relation to the intensity of daylight, thereby maintaining a specified minimum level of brightness and reducing energy consumption.
- **Time saving** Interlinking all communicating devices with a single bus considerably reduces design and installation time. Unique Engineering Tool Software (ETS) allows the design, engineering and configuration of installations containing KNX certified products. As the software tool is manufacturer independent, the system integrator is able to combine products of different manufacturers with different communication media to one installation.
- **Flexibility and adaptability to future developments** A KNX installation can be easily adapted to new applications and is easily extendable. New components can be easily connected to the existing bus installation.