Content

Smart Metering & Smart Building 2
Energy Efficiency in School Buildings 3
Energy Efficiency in Houses 4
Energy Efficiency in Industrial Buildings 5
Renewable Energy 6
IP Control 7
LED Control 8
Audio & Video Control 9
iPhone® Control 10
WLAN Control 11
Safety & Surveillance 12
Heating, Ventilation & Air Control (HVAC) 13
Kitchen control 14
Sun Blind Control 15
Ambient Assisted Living 16
Three-fold Networking for Car Showroom 17
Outstanding Reference in Moscow 18
Delhi International Airport with Efficient Lighting 19
Home Automation – To Luxury Standard 20
Multimedia with ECO Mode 21
Multifunctionality in Community Center 22
My Smart Home is My Camper Van 23
Showroom Vividly Presents Building Automation 24
Superlative Holiday Resort 25
Success with Energy Management 26
Pupils Build a European ‘Smart Home’ 27
## Task
KNX is a worldwide standard for home and building control, offering new products in the market of visualization and smart metering. The increasing number of products by different KNX manufacturers in this market segment provides a good variety of installation options. In addition, it is intended to demonstrate the option of installing active tariff management.

## Solution
The use of metering for electricity, heat consumption, fill level monitoring and water meters with electronic data recording and storage facility ensures the safety of the system in case of power failure. Complete visualization of the data with integrated consumption display and diagrams is available and easy to configure. This solution makes it possible to record and monitor the consumption of each KNX unit connected to the system.

## Implementation
By connecting the sensing devices to the KNX bus system and linking this with the IP domain it is possible to display and process the respective data on the touch panel. The software by Promoveo-Technology is used to record and evaluate the data so that users can readily see the consumption of the various media, i.e. electricity, water, gas, solar and heating in the past and the consumption can be extrapolated for the following week. To benefit from different electricity tariffs, it is possible to use power-intensive equipment during the cheaper periods. In this way users of this technology can react to tariffs as they change and use them to their advantage.

## Functions
- Display of electricity tariff (cheap, expensive)
- Heat consumption meter with KNX interface
- Electricity meter (different types of energy meters with flexible IR-interface)
- Water meter with KNX interface
- Control of filling levels for tanks (oil, water, liquids)
- Evaluation of consumption data and display in diagrams
- Display of consumption levels - high, average, low - represented by red, yellow, green
- Display of electricity tariff with the option of manually connecting or disconnecting electrical equipment

## Benefits
The system represents a worldwide standard and can be used to display the consumption of different types of energy in buildings. The customers can check their consumption data by pressing a button. The energy management software can be used to connect or disconnect power-hungry equipment (washing machine, dishwasher etc.) to benefit from cheaper tariff periods. KNX helps to use energy more economically while enhancing comfort and security.
Energy Efficiency in School Buildings

Task
Proposals are being sought for new construction and refurbishment of school buildings. Functions to be covered are lighting, solar screening and heating as well as, increasingly, ventilation. An important objective of KNX automation systems is energy efficiency, the local control of which is a particular priority during school hours. It is intended that the energy conservation measures are also demonstrated to the pupils for educational purposes.

Solution
Lighting in the classrooms is switched on and off manually, activating a movement sensor with constant lighting control which will automatically switch off the light after the lesson. The KNX controls of the blinds ensure precise screening with optimum daylight levels during lessons; when the room is not occupied they will close for cooling in the summer and open up for solar gain in the winter. For the heating system, operating modes such as ‘comfort’, ‘economy’ and ‘frost protection’ will be activated automatically in accordance with the lesson and holiday schedules. The rooms are ventilated via electrically operated windows. It is still possible to open the windows manually, but the KNX CO₂ sensors will detect stale air levels and activate automatic opening. For education purposes, the energy consumption data is available on the display system or on the internet. This includes the CO₂ values as a result of the ventilation function.

Implementation
The following products are installed on the panel:
• An Amun 760 (Theben) CO₂ sensor measures the CO₂ concentration and current temperature/humidity in the room
• Windowmaster NV Comfort as the central unit for natural ventilation uses measured data to calculate window control strategy
• Windowmaster Motorcontroller WEC 16M including drive controls and opens/closes the windows
• A KNX/Dali Gateway (Gira) controls the lighting, including dimming function
• A movement sensor (Busch-Jaeger) takes care of constant lighting control and detecting the presence of people
• The Ambientomura (TCI) touch screen with visualization software facilitates operation and displays functions and data.
• A radio transmitter and KNX RF media coupler (Hager) can be used to provide the data in refurbishment projects.
• In addition, there is a KNX water meter (Arcus-EDS) which monitors the sanitary facilities for excessive use of water.

Functions
The light is switched on at the start of lessons. The constant lighting control can be started up by shining an external lamp (flashlight) at the sensor. A bus button is used for manual dimming, which will de-activate the constant lighting control. The current CO₂ concentration is displayed in a diagram. When the value changes, the window opens slowly. For optimising the ventilation functions it is possible to set the parameters at the NV Comfort Panel. All consumption data in the rooms is displayed to suit educational purposes.

Advantages
• Energy efficiency through KNX automation with manual operation a priority.
• Automatic natural ventilation with the option of manual ventilation when this is required due to rapidly changing requirements.
• Educational format of information to increase pupils’ energy awareness.
Energy Efficiency in Houses

Task
The rising cost of energy together with a more careful use of energy have moved up on our society’s agenda. For this reason, we need new solutions for the optimization of energy management — something that can be achieved by applying the KNX standard.

The Solution
Where KNX systems are installed, the residents are informed about their current energy consumption so that they can use it in the most economical way. When KNX is used to control and monitor the various domestic applications, total energy consumption will be reduced. Moreover, users can monitor their actual energy use on visual displays and have the opportunity to take action in order to reduce their consumption as much as possible, whether they are at home or away from it.

Implementation
Solutions for an average home:
• Lighting control (MECEL) with capacity for the control of the whole house in zones or as a group.
• HVAC control with KNX (Intesis) capable of controlling any equipment on the market.
• Touch screens (JUNG and Zennio) will provide visual displays of the house.
• A GPRS module (Analasuslabs) will allow users to control the system when in the house or away from it.
• Smart Metering devices and software (Multidomo Networks) for metering the consumption of energy, water, gas etc.

Features
• Dimming of lighting to suit users’ needs
• Optic fiber sensors for better night-time signaling
• Different scenarios, according to the users’ needs
• Monitoring for system overload
• Integrated thermostat for easier use and control of HVAC equipment in order to get the best use
• Real-time monitoring and recording of data (temperature, consumption of energy, water, gas…) providing a general overview of use and allowing users to take further actions

Advantages
By integrating all applications into one single KNX installation, users have many options for easy and comprehensive monitoring with a control system that is intuitive to operate and use. In addition, there are the following advantages:
• The optic fiber sensors can be installed in any part of the house.
• Smart metering consumption will make users aware of wasted energy, allowing them to save energy and money.
• The timer can be re-configured to suit individual needs and can also be stopped at any time.

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Energy Efficiency in Industrial Buildings

Task
Three interesting applications are used to demonstrate the multiple possibilities that KNX offers in the industrial sector. In an energy-efficient combined heat and power plant, one or two additional gas furnaces, gas heaters or older gas burners can be added when more heat is required. The lighting should be switched on only when needed, in factory buildings only in active areas where work is being done. When regulating room cooling in offices, it is of special importance to avoid condensation on the cooling floors.

Solution
Thanks to new components, the distribution of heating energy and the regulation of the room temperature could be realized with KNX. A combination of KNX with DALI digital light control ensures sufficient lighting with constant light control and emergency lighting. The required dew point monitoring and dew point shift could be accomplished with newly developed KNX sensors.

Implementation
- As a central element of visualization where the devices are controlled and monitored, a Gira Facility-Server was installed.
- A 19” touch screen serves as an impressive operational control.
- For heating regulation, temperature probes (Arcus EDS SK01 T) and actuating drives (Heimeier EMO EIB) were used.
- A Logo/KNX coupler (Siemens) is used as an interface between manufacturing data and lighting control.
- Presence detectors and constant light control (BEG Luxomat) as well as a KNX/DALI gateway (Siemens) prove their strength where energy efficient lighting and emergency lighting are required.
- Dew point monitoring is realized with an enthalpy sensor (Arcus EDS SK03-TTFK).

Functions
Actuating drives and mixing valves are activated by Visu according to heat requirements. The Facility-Server calculates the expected energy requirement, and switches additional heating systems when needed. When persons are detected in offices and when manufacturing processes are running, the corresponding lighting is switched on automatically. When the dew point is reached, a mixing motor is activated and the flow temperature is regulated so that no condensation will occur on the cooling floors.

Advantages
Versatility of the system: KNX is used to control lighting, heating, room temperature and caters for efficient energy use in industrial buildings. At the same time, a comfortable environment is created and the building fabric is protected, while emergency lighting is available in compliance with regulations.
Renewable Energy

**Task**
eSolar is a supervision and local/remote maintenance management system for photovoltaic (fixed or solar tracking) plants. The system consists of low energy consumption hardware, installed in each photovoltaic plant, which can universally acquire data. eSolar integrates a domotic engine that communicates through the KNX protocol. Web access to the device is possible via LAN or mobile networks like GPRS/UMTS. Installed in a control center, this server allows the parallel monitoring of several plants. i.e.

- real time monitoring of the correct functioning of all components of a photovoltaic plant
- periodically picking up data coming from different plants
- management of logging data of several plants
- comparative analysis of production and performance of different plants

**Solution & Implementation**
eSolar can communicate with the majority of commercially available inverters through RS232 or RS485 serial communication ports to acquire the measured source. It can also communicate with energy counters, tax counters or net analyzers through its communication ports RS232 or RS485 or impulsive outputs to acquire the measured source. Through KNX, eSolar can acquire data coming from different kind of commercially available sensors to realize the necessary action (temperature and other environmental parameters, automatic actuating system for cooling and cleaning of photovoltaic modules, photovoltaic tracking systems control, electric load management etc.).

It can record and store data on a daily, monthly and annual basis for ten years and permits graphical or table visualization of this data. eSolar can, autonomously and automatically, supervise data and initiate scenarios or scheduling depending on events (dispatching of alarm signals through e-mail or SMS, initiation of cleaning operations in case of dysfunctional performance decrease, control of electric loads, generation of production reports, start of scenarios and schedules depending on real-time comparison of energy production and plant load curves, signalling and actuations start up in case of theft attempt etc.).

**Features & Advantages**
- Guaranteed communication with the majority of the commercially available conversion and energy counting systems, as well as with standard sensors for the collection of environmental parameters.
- Thorough and detailed information on energy production, its efficient use and benefits and generated savings.
- Real-time information from supervised plants for maintenance and properly timed interventions
- Communication with home and building automation systems is a strategic function enabling load management, creation of energy policies, initiation of domotic scenarios, and an increase of building energy efficiency.
IP Control

Task
The task scenario was the refurbishment of a commercial building (in this example, a bank). Applications include centralized and decentralized control of daylight-dependent lighting, temperature and volume flow with special focus on energy efficiency. Due to the large floor area of the tower block with a total of 18 floors (five sub-floors, one mezzanine, ground floor, 11 upper floors) and the high number of data points to be processed (approx. 30,000) the building had to be sub-divided into several KNX domains. Another aspect is the technical implementation of the customer’s security requirements for certain areas.

Solution
Together with the designers, TAST Deutschland agreed on eight KNX domains which are connected with each other via glass fiber cables and media couplers. This created a KNX IP backbone and sub-distribution lines, using additional line couplers for distributing the signals on the KNX system.

Implementation and functions
• Control of lighting in the public areas via buttons and central functions.
• Control of lighting in the offices with active constant light control.
• Decentralized individual room temperature control in all offices (Jung room controller) with target values provided by the building control system. Valves (Oventrop) for heating and cooling ceilings are fitted with analogue controls.
• Volume flow control in the offices in accordance with data provided by the building control system. The heating of rooms is controlled via the flow control mechanism (air intake and air exhaust in parallel).
• Central functions are enabled via coupling to the building control system (Desigo Insight) as well as central KNX visualization.

Advantages
With the help of the sub-division into KNX domains and cross-linking via KNX IP networks, it was possible to create a very stable KNX system with reduced (optimized) bus load while at the same time improving stability and performance. With the help of the high number of presence and movement sensors, the KNX visualization and the building control system link it was possible to achieve additional reductions in operating costs. An added benefit is the fact that the sub-division allows parallel processing of the databases. The easy and economic installation of the KNX bus in two-wire technology, together with the almost unlimited technical possibilities for control of lighting, blinds, heating, ventilation and air conditioning, is particularly advantageous. The field bus allows the transfer of large quantities of data; this meets the new requirements of bus systems used for the control and transmission of data for the purpose of energy and maintenance management.
LED Control

Task
Modern LED technology allows for attractive lighting effects that can be used in shops, shop windows, lobbies, bars or in the home. This is a new task for KNX and system integrators. Color temperatures can be changed to create different kinds of mood lighting. The application demonstrates how LED lamps can be activated and controlled via special lighting control devices.

Solution:
Riwitec, an electrical installation company from Innsbruck, uses the new LED lighting technology for KNX by Bilton. KNX sensors and controlling devices, as well as LED strips, LED spots and spot lights for rails are used to demonstrate how easy it is to create lighting scenarios with LED lighting technology.

Implementation
The presentation will be realized with the following KNX components:
• The universal dimming and sequencing actuator for KNX (Bilton) is used as a direct interface to the LEDs for switching and dimming.
• A universal dimming and sequencing actuator for power LEDs in the range of 350/500/700mA (Bilton) is used as a second actuator. This device can activate individual colors as well as built-in RGB spots with LEDs.
• Also, we will show how the Nexus spot light for rails with an integrated KNX interface can be used to create mood lighting. Color temperatures in the range between 2800 K and 7000 K can be switched or dimmed with this device.
• A KNX presence detector (BEG) and a light sensor are used for automation purposes.
• The system (installed in a vertical board) is accessed and controlled either via a pushbutton (Gira) or via a Comfort-Panel (Busch-Jaeger).

Functions
Users can switch and dim the lighting via the touch panel of this comfortable device and select colors. Depending on the time of day, they can pre-set different colours and color temperatures for the Nexus spotlight. A presence detector is used to trigger different logic operations in order to change the colors when a person appears. Daylight brightness is also measured in order to achieve an optimum light intensity in interior rooms.

Advantages
KNX allows integration of LED lighting in a simple and intelligent way. There are solutions for numerous applications such as art galleries, museums, shops, architecture and especially for residential and non-residential buildings. One example is the changing of color temperatures using simple LED strips. Users will feel comfortable in this environment, because the lighting system provides optimum color temperature, intensity and effects.
**Audio & Video Control**

**Task**
The control of audio and visual media is an interesting task for KNX. In an ‘intelligent’ house, in which the electrical installation has already been carried out with bus technology, it is possible to activate music, news or video films in the respective rooms.

**Solution**
The optical highlight of a ‘virtual’ house should be a monitor for showing films or slides and playing videos etc. In order to show the function of a multi-room audio system, two rooms are simulated in which different media can be played. But it is also possible, in ‘party’ mode, to play the same music in all rooms. The system is centrally operated via different touch panels or via bus button in the individual rooms. In home installations, a TV set or projector would be used as a display, which could also be controlled by the KNX system.

**Implementation**
A 17” touch screen element (AMX) is used to show films and videos. This can be operated via the KNX visualization, which can also be displayed. Another touch panel (Merten 7” KNX touch panel) is used as an operating unit for controlling the media as well as the general KNX system for lighting, heating control and solar screening. Two loudspeakers are used to simulate different rooms or audio zones. There are touch sensors for each different zone, indicating the compatibility with the KNX system. Content such as pictures, videos and music are stored in digital form in an audio/video media server and are activated via the KNX domain as well as the AMX visualization domain. Audio output is controlled via the integrated Russound audio multi-room system. Both the AMX video components and the Russound multi-room audio components are perfectly integrated into the KNX system via KNX gateways.

**Functions**
The installation of the different touch displays with their respective surfaces shows the multiple options for operating equipment with respect to technology, design and operating comfort. The different brightness and volume controls, also available as a slide controller, demonstrate the variety of operating options. In addition it is possible to activate audio and video content or to adjust the volume via conventional buttons or KNX bus buttons.

**Advantages**
There is no need for additional control systems. The media controls are simply integrated into the KNX installation which is already in place, making this functional solution even more economical and visually appealing, as the operating elements match the other parts of the electrical installation. Interfaces for TV sets and media sources are readily available in the respective retail outlets.
Task
Realization of a KNX control for iPhone, iPod Touch and iPad

Solution:
ibs intelligent building services gmbh presents a solution that uses standard KNX components for all home and building applications. The application is based on the m..remote visualisation software in connection with the new m..myhome server.

Implementation:
m..remote Client is a freely configurable visualization software for iPhone, iPod Touch and iPad. The GUIs can be created in a special editor and will then be loaded to the end device. Mobile devices communicate with the system via a WLAN connection into the local cable-based network. Processing and communication with KNX installations is realised via the m..myhome controller. This technology uses KNX IP. The controller can handle up to 50 KNX addresses at a time. A variety of protocols can be adapted, therefore the system can also be used for complex media controls and allows integration of all internal functions available in the world of KNX. The built-in scripting engine makes it easy to initiate complex command sequences.

Functions
Users can access typical functions of advanced home and building automation (such as lighting systems, heatings and blinds) via wall-mounted controls and mobile devices. Audio and video controls are also integrated. A touch panel is used as a central control, allowing access to KNX functions and to the world of digital media such as TV and audio. The integration of an iPod Touch as a fixed wall control will also be demonstrated. This solution is especially useful for hotels. The wireless integration offers both maximum flexibility and maximum functionality.

Advantages
The advantages of this solution are undisputed. Being a so-called native App, the m..remote visualisation offers speedy access times. This system helps to avoid typical latency times that occur in web-based solutions. When integrating media technology, this is a decisive advantage. This solution offers an easy entry into the world of home and building automation at a truly competitive price. The system includes a 10" touch panel of the latest generation.
WLAN Control

Task
Systems for media technology and building automation are becoming ever more complex. Installers are increasingly confronted with data processing tasks. A minimalist solution is called for, that allows users to create and monitor light and shadow without a “server”, using a simple remote control from their armchair. Also, they should be able to create lighting scenarios and to switch HVAC appliances or security functions. The possibility of ETS parameterization via WLAN is also a requirement.

Solution
Decentralization is a definite strength of the KNX bus: Without a central computer all home data such as switching status and temperatures are available on the bus. This great feature of KNX was used in the development of freely configurable software for media remote control and enables server-less central control, monitoring and data recording.

Implementation
The image shows a remote control for media access that communicates with the bus via a WLAN router and the ProKNX gateway. The communication objects of the gateway are allocated to group addresses via ETS in the usual way. An editor is provided free of charge that allows the combination of the components used in a home via icons. Also, it allows for the configuration of media devices.

Functions
Apart from simple switching actions, users can set lighting scenarios and save them in the actuators according to the KNX specification. These scenarios can be combined with macros for the control of media technology, e.g. to shut the blinds or roller shutters and to dim the lights when a film starts. There are controls for individual rooms, and operating statuses can be switched via integrated timers. Temperature and energy values are saved every hour and can be displayed as a linear chart for the past week.

Advantages
The configuration shown here can be used for an intuitive control of the entire house without any additional hardware – the ProKNX gateway and a media remote control are all you need. You can easily integrate media devices and a variety of other components and control them via wireless access. Installers can create or retrofit KNX installations with this technology without knowledge of a programming language.
Safety & Surveillance

Task
Gepro, located in Stralsund, offers practical applications for a broad range of uses such as offices, restaurants, hotels, exhibitions, theatres, swimming pools, sports complexes, zoos etc. The installation demonstrates how security functions can be integrated into KNX installations. A clear concept of use for commercial applications is of special importance to Gepro.

Implementation
A VDS burglar alarm (L240 ABB) with a visible LCD user panel and an LED flashing beacon are central components of the installation. Motion detectors (HTS) and window contacts are installed to demonstrate how burglar intrusion can be detected. Fire alarms for KNX (Siemens) and water detectors (Lingg & Janke) are shown as an example for additional security and monitoring functions. A touch display is used to visualize these functions. Additional operator devices for arming the alarm system and for function displays are realized as pushbutton panels with LEDs (GePro): key-operated switches can also be integrated. Peripheral components such as binary inputs (Theben), actuators (Zenio) dimmers and interfaces work invisibly in the background, while a server-box provides the logics, show effects etc.

Functions
Different functions can be demonstrated. When arming the circuit via a key-operated switch, an acoustic signal is used as confirmation. LEDs display all functional statuses. The switch used for arming the circuit is also used as a central on/off switch for the lighting system. After arming the alarm system, motion detectors will trigger an alarm when a person is detected or a window contact is opened. A signal lamp is activated and an alarm is passed on as an SMS to a mobile telephone. When the alarm system is disarmed, the lighting can be switched on or off as usual via the pushbuttons. Motion detectors are used for automatic switching, and the status of window contacts can be used to display open windows and to turn off heating radiators. Alarm functions of smoke detectors and water detectors can be used for local display as well as for remote alarms.

Advantages
One system for all applications. Components can be used in multiple ways so that synergies are realized and bus installations can be put to additional use. Using KNX, flexible security concepts can be put into practice with different functionalities, sensor applications, alarm management and user concepts. The demonstrated bus installation components for KNX comply with VDS (German notified body for accreditation of these systems) and are available on the market.
Heating, Ventilation & Air Control (HVAC)

Task
The archives of a District Council require a central control system as well as remote control for its lighting, blind and security systems and, in particular for the heating, ventilation and air conditioning. Special focus is on maintaining the values for air quality and those required under the Workplaces Directive.

Solution
Beger and Sporleder produce a model presentation of the KNX system implemented by EGB. The equipment and systems for sensors, actuators and displays are provided by different KNX manufacturers. The selection of these focused on optimum functionality and economy. In addition to KNX TP, the transmission medium KNX RF is used. The central operation uses a visualization screen and touch panel.

Implementation
The air quality values in the offices and archives are measured by sensors (Elsner) for temperature, humidity and CO₂ content. These values are used by the IRSC (Zennio) air conditioning controller to control the split air conditioning units and by the KNX controller (Buderus) to control the heating system. A KNX weather station supplies further data for the lighting, the blind system etc., such as precipitation, wind speed, daylight levels and a DCF77 time signal. A visualization was selected for the central operation and display of faults, measured values, operational and switch status. This will also link the building functions and transmit the data, alarm and fault messages to a facility management system via intranet and the telephone network. This system also makes it possible to carry out remote parameterization via the ETS.

Functions
The visualization is used for central operation and provides technical personnel with the operating status and messages, both internally and externally. Manual operation is possible from remote locations as is the receipt of messages by a mobile phone with internet connection. Settings for lighting, air conditioning and ventilation can be set automatically in accordance with the service schedule. Likewise, when the lock system registers contact from the locking bolts, the operating status, such as ‘standby’ or ‘comfort temperature’ for the respective building area will be set automatically. For monitoring the air quality in the archives, data for CO₂, humidity and temperature are recorded and saved automatically.

Advantages
KNX proves its strength particularly when it comes to complex applications: simplified installation, multiple benefits for different applications and flexibility regarding changes in user programs. In addition, the system can be used for remote control where this is required due to the location of the properties.
**Kitchen control**

**Task**
"Intelligent buildings" integrate high-level comfort, security and energy efficiency. Requirements for central controls in kitchen technology should be equally high. EIB-TECH presents a functional and versatile visualization of controls for all appliances and systems in the kitchen area. It’s also great to look at! A requirement for the user interface: it should be easy to understand and simple to use for all members of the family.

**Solution**
As a KNX service provider, EIB-TECH offers a solution containing individually designed visualizations that allow integration of the entire kitchen technology into KNX systems. A remarkable feature of this KNX solution is a three-dimensional representation of floor plans, building elements and exterior views in the visualization. Users can see entire rooms instead of two-dimensional floor plans. Icons that can be used to directly control all connected kitchen appliances show their current status or value.

**Implementation**
The visualization application is running on a touch panel device. Direct connection to the kitchen appliances is integrated via a gateway. The entire KNX technology within the house or building is integrated: Actuators for switches, dimmers and blinds etc. Controls for individual rooms are installed as well as window contacts for multiple uses: they allow turning off heating radiators when the window is open, they are used to check the window status and they serve as a burglar alarm. Lighting scenarios for selected lamps, dimmer values and blind statuses can be combined and saved for later use.

**Functions**
- Switching and controlling of kitchen technology and kitchen appliances
- Temperature control and set-point adjustment for connected refrigerators
- Switching and dimming of lighting
- Use of pre-set lighting scenarios
- Composition of lighting scenarios with respective dimmer values
- Set-point adjustment and creation of temperature profiles for heating radiators.
- Documenting and querying of weather data (wind, rain, daylight)
- Checking of windows and doors
- Control of media systems etc.
- The visualization application gives users access to internet functions such as weather service, schedules, telephone calls, e-mail etc.

**Advantages**
- A high-end control center that has been designed with users in mind: it can be visually and functionally adapted to the specific requirements of kitchen users.
- Ease of use for the whole family as well as access to system functions for experienced users.
- A great variety of design touch panels allows all KNX users to find their own attractive control center.

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Sun Blind Control

Task
A sun-screening system in modern office buildings needs to fulfill two functions: ensuring comfort levels at the workplace and at the same time enhancing the energy efficiency of the building. The presentation shows a model of an installed system in an extensive building complex with several floors, internal courtyards and 2,500 solar screening sectors.

Solution
In order to achieve the best possible screening results for daylight levels, cooling in summer and heat-gain in winter, BMS selected KNX-based automatic solar tracking system.

Implementation
The equipment used for the sun blind control is the SunControlServer by BMS. A weather station with four centrally placed light level sensors provides data regarding solar radiation, wind and rain throughout the day. Movement sensors in the offices detect the presence of persons. Based on this data, the software controls the solar screening system, taking into account the sun’s current position and angle of irradiation, and any shadows cast by parts of the building. The blinds are moved by conventional actuators. A visualization device is available to assist operation. It is also possible to operate the individual blinds manually.

Functions
When the sun is shining the blinds on the respective facades are activated to provide shade. This means that their louvres are adjusted such that daylight levels are optimized while avoiding glare. Artificial light is switched on via the movement sensors when required. If nobody is in the room, different commands are transmitted to the drives, depending on the season: in summer the blinds will close fully in order to avoid heat gain. In winter the louvres open wide to allow solar gain.

Advantages
Through the automatic sun tracking device for each individual façade, a comfortable workplace atmosphere is achieved in all offices. Energy savings are achieved by reducing the use of artificial light, by maximizing heat gain in winter and minimizing energy used for cooling in summer. The SunControlServer software is suitable for single family dwellings and complex situations.

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The term ‘ambient assisted living’ refers to living with technical support for older people. The reason is that more and more senior citizens wish to continue living in their own homes. For this reason, many corporate landlords and private individuals modernize their properties not just from the energy point of view, but also to make them ‘senior-friendly’. Cibek’s presentation demonstrates how ambient assisted living (AAL) can be implemented with KNX.

Solution

Cibek is involved in grant-aided projects researching technologies that make it possible for older people to live in their own homes and offer safety in certain risk situations. The solution presented uses movement sensors for localization as well as information from the use of buttons for detecting activities. The KNX standard is used because of its economy and versatility.

Implementation

The displayed concept shows examples of how one can upgrade existing homes using KNX TP and KNX radio components in order to improve comfort and safety. In addition to the KNX units, there is a mobile touch display for visualization, which has been specially developed for older citizens. A design study shows how one can use an iPod not only as a small, mobile visualisation display, but also as a multi-function switch for a senior-friendly operating concept, using a specially developed screen.

Functions

To demonstrate the functions the board was equipped with:
- UP units with switch actuators, blind actuators (Gira), KNX RF radio components (Siemens) for activating the lighting, controlling the blinds and the heating system.
- Presence sensors (ABB) switch on the light automatically and in addition provide information about the presence of persons.
- The system is operated manually via a 5-gang bus switch with temperature controller (Gira) as well as via a mobile 12”‘senior touch display’ (TCI).
- The ‘multi-functional button’ is the outcome of a design study carried out by Cibek in cooperation with Gira.
- The following equipment is in operation at the back of the board: IP routers (ABB), voltage supply (Ling&Janke), Cibek Mini-Server, Cibek Gateway and a WLAN node (for iPod).

Advantages

KNX functions can be implemented as part of refurbishment in order to support ambient assisted living for older people. In addition, the data from installed sensors such as movement sensors, operating equipment etc., can be used for the detection of irregular patterns compared to the regular activities of the person, indicating situations in which help may be required and alerting the respective care service or relatives.
Three-fold Networking for Car Showroom
Central management via KNX / IP and internet

To the south of Lake Maggiore, the well-known Concessionaria Autoarona operates three branches: an Audi center in Arona, a showroom for Skoda in Dormelletto and in Paruzzaro a Volkswagen showroom where fans of this brand can find the car of their dreams. The new display premises are impressive with their modern architectural style. The glazed facades allow a lot of daylight to flood in, resulting in a pleasantly bright interior.

In this environment, it should be a true pleasure to choose one’s favourite model from this high-end brand. Artificial lighting provides interesting highlights in the showroom – controlled and dimmed via KNX. Right from the beginning, Autoarona opted for a flexible bus system which allows quick and easy adaptations of the installations when changes in the use of the buildings require modifications. An important factor for selecting the world standard for building automation was also the guaranteed compatibility with a range of different brands. This has been well worth it – particularly when it came to networking all three locations with one central station via KNXnet/IP. However, the main emphasis was on modern, high-quality building services which reflect modern automotive technology.

Broad application spectrum with integration of special systems
Back in 2001 the first showroom in Dormelletto was equipped with the future-oriented KNX building system technology. In 2007 the installation of the new display area in Paruzzaro followed suit, and not much later, the interior refit of the new showroom in Arona. A broad application spectrum was implemented with KNX: lighting control systems with dimmer function and emergency lighting. An example of one of the features is that the lighting is switched off centrally when the intruder alarm system is set. In contrast, when the alarm system is activated, the lighting switches on as a deterrent and panic function. Likewise, an intruder alarm will activate the roller shutters and close them. In all other cases these are controlled manually or automatically via a weather station. KNX also controls the room temperature where under-floor heating has been installed. In other areas, heating and cooling is provided via fan coils which are also controlled via KNX room temperature controllers. At the AutoArona facility, the air conditioning and heating system is linked to KNX. In addition, an audio PA system in the showroom can be operated via KNX.

However, the feature that especially impressed the jury when it selected the project for the award was the networking of the three locations across a distance of many kilometers. All three KNX installations are linked together via KNXnet/IP to a central visualization facility. This means that the three KNX installations communicate with each other via the internet. In this way, the technical department at the headquarters can control all functions such as lighting, heating, ventilation, cooling, roller shutters and security technology, receive messages about technical failures and pass on alarms. At the same time it is possible to operate and maintain the installations remotely via KNXnet/IP. The universal application of this world standard for building services is further highlighted by its interfaces with the intruder alarm system, the fire alarm system and the HVAC system.

Benefits provided by KNX in this project
- Changes to the services installations are quick and easy to carry out when these are required due to modifications in the buildings.
- All different services functions, such as lighting, heating, ventilation and solar screening can be linked to one visualization facility.
- Technical fault reporting systems and their central monitoring can be connected.
- Integration of the intruder alarm system.

Companies involved
Building owner: Autoarona SpA, 28040 Paruzzaro, Italy
Architect: Massimo Corradino, 13011 Borgosesia (VC)
Services Engineers: Studio Tecnico Alberti, 28100 Novara
Electrical Engineers: IME die Pastore C SNC, 28021 Borgomanero (Novara)
KNX System Integrator: MAPE SAS, 28021 Borgomanero (Novara)
Currently, the “Federazija” in the Moscow International Business Center is probably the most spectacular building complex in the Russian capital. The skyscraper, with its 243-m-high towers “Zapad” (West Tower) and “Wostok” (East Tower), was completed in 2010. Originally the planned height of the East Tower was 360 m, with an antenna of 506 m. Of the 64 floors in the West Tower, 33 stories with an area of 60,000 m², are occupied by the Russian Bank VTB and used as different kinds of offices, including those for the top management, and conference rooms. The importance of the bank for the Russian financial market is best illustrated by the fact that the national market leader maintains branches in 114 cities and is represented in 21 countries worldwide.

KNX has therefore won quite an outstanding reference in the true sense of the word. Modern technologies for comfort, energy conservation and security are increasingly in demand in Russia, following the trend of new developments in the construction sector. With this project, KNX has met all conditions for openness, compatibility, efficiency and scalability in an ideal manner.

Functions for comfort and efficiency

Engineering and system integration of the extensive KNX installation with its approximately 3,600 bus sharing units was carried out by the EcoProg Company in Moscow. This engineering company was formed in 1990 and is a very competent building automation provider with several years of KNX experience, based on prominent projects all over Russia. In the VTB contract, the company had to create a comfortable and secure environment for staff and customers using building services functions and facilitate efficient operation of the technical installations.

For example, a constant lighting control system which takes daylight levels into account was installed in order to provide reliable and yet economical lighting. In the top management offices and conference rooms, adjustable scenarios with switch and dimmer functions for the lighting, solar screening and black-out functions for presentations contribute to perfect meetings and conferences. In order to reduce energy costs, it is possible to activate different operating modes for air conditioning and heating using the KNX control system via manual operation, presence sensors or the BMS. Likewise, the valves and control of the additionally-installed fan-coil units are efficiently operated via a control algorithm, depending on the ventilation and air conditioning operating modes.

Interface to the Building Management System

The functional reliability of the different bus lines is ensured through additional USV units. In addition, the lines of the different floors are linked via LWL.

Central management, monitoring and visualization of all processes are carried out via the Building Management System (BMS). It combines all building services systems, including the KNX installation, via an RS 232 interface. The system allows central monitoring, setting and operation of all KNX functions in addition to their local manual operation via buttons or touch panels, as well as the automatic functions via movement sensors, light sensors, room temperature controllers etc. The highlight of the building control technology is the display of technical information on four 46” LCD monitors.

Benefits provided by KNX in this project

• High degree of dependability, reliability and quality for the operation of the lighting and air conditioning systems
• Reduced power consumption through optimization of operating processes
• Comfortable operation for customers and staff
• Central control through integration with the BMS

Technical refinements

• Constant lighting control in the offices
• Automatic lighting control via movement sensors and BMS in public areas
• Manual and remotely controlled temperature setting in the offices
• Controlling lighting scenes in the conference rooms and top management offices in combination with media technology
• Central visualization of all KNX functions via the BMS

Companies involved

Building owner: Bank VTB, Moscow
Architect: NPS Tchoban Voss, Berlin/Hamburg/Dresden
Engineering and system integration: EcoProg Ltd, Moscow
www.ecoprog.ru
Delhi International Airport with Efficient Lighting

KNX shows world class format at the new Terminal 3

At the new terminal of Delhi Airport, 100,000 light fittings and KNX provide an efficient lighting system.

With 27 million passengers a year, Indira Gandhi International Airport in New Delhi is the busiest airport in India. The airport handles about 100 domestic flights and is a destination for 70 airlines worldwide. As a gateway between agricultural land and the highly developed industrial region, it is of great commercial importance. As one of the fastest growing airports, Delhi Airport opened its new Terminal 3 in June this year. The 111,600 m² large building complex was designed especially with the Commonwealth Games in mind – an important international sports event taking place in October 2010. Visitors from all over the world will be welcomed in worldclass style at Terminal 3, which has a handling capacity of over 10,000 passengers per hour. This is supported by a lighting system with about 100,000 light fittings which ensures passengers’ well-being and safety, and helps them to find their way. The control system is based on ABB I bus KNX technology and designed by Entelechy Systems. The hitherto largest KNX reference in Asia, with 11,000 components, has been selected for the International Award Asia.

Comfort lighting only in active zones

Where there is daytime and nighttime public circulation, such as in an airport building, the lighting must be switched on 24 hours a day. Nevertheless, there is scope for energy-conserving lighting management – brightness can be reduced, and automatic dimming and switching can follow patterns of demand; it is possible to make maximum use of daylight, and systems can be automated using timing and occupation programs. The public areas were divided into zones in order to facilitate implementation. In the busy areas, lighting remains switched on continually at full brightness. In areas which are only frequented during certain hours, for example, Arrivals and Departures, the lighting is controlled according to whether the zone is activated or deactivated. In deactivated zones, the light fittings are operated with a preset dimmed value of 10 percent whereas in activated zones, the lighting is on continually at 100 percent brightness. For example, in vacant sanitary facilities, presence sensors will reduce the lighting brightness from 100 to 50 percent, whereas full lighting levels are reactivated when someone enters. Likewise, lighting and HVAC in the offices and service rooms can be controlled by presence sensors to suit demand. This means that comfort and personal needs are fully catered for; certain lighting in deactivated zones can also be switched on manually. Operating and setting the lighting functions is possible from the workstation of the CMS management system.

Complex integration of building services

The Delhi Airport project represents an outstanding reference for KNX in India and Asia. The flexibility of the system, its connectivity with other standards and the option of combining decentralized functions to one central building management hub were decisive factors in its favor. This latter function is performed using IP routers, KNXnet/IP and Ethernet network. This allows central control of the lighting system and connection of error messaging via interfaces with the Building Management System. Presence sensor signals are evaluated by the Control Monitoring System of the heating, ventilation and air conditioning installation in order to establish the correct room temperatures. Alarm messages from the fire alarm system activate emergency lighting and the lighting on escape routes and, last but not least, the consumption data computed by KNX can be used for cost control purposes.

Benefits provided by KNX in this project

• KNX provides the ideal basis for energy-conserving lighting control systems.
• The communication between KNX and the Building Management System (BMS, Honeywell), the heating, ventilation and air conditioning system (HVAC, ETA), the fire alarm system (Fire CMS, Minimax), a Network Management System, the Energy Management System (Electrical CMS, ABB) and the integration of visualization software provide the basis for complex applications involving energy conservation, safety and comfort.

Technical refinements

• The capability of the KNX system is demonstrated by the fact that it can cope with 100,000 light fittings which are switched and dimmed, and by its perfect coordination of functions such as switching and dimming, lighting control, light sensors, brightness sensors, presence sensors, logic control components and central management with visualization.
• The creation of interfaces to six different Control Monitoring Systems with international standards.

Companies involved

Building owner:
Delhi International Airport Ltd (DIAL)
Architects and Electrical Engineers:
GMR, New Udhani Bhawan
HVAC contractor:
ETA, ETA Consortium, Delhi
Electrical contractor:
ABB, New Delhi
The view from Mark Hills across the River Han and the Seoul skyline is breathtakingly beautiful. To the south of the ten-million-inhabitant metropolis and 600-year-old capital of Korea is a new development including luxury apartments. These are the residences of famous film, music and television stars and bosses of industrial corporations, banks and stock exchanges. The 18 apartments in Mark Hills, the KNX installation of which was selected for the International Award Asia, are also reserved for the ‘privileged’ classes. The apartments, with their 400 m² of living space, are equipped to high quality standards including building services, which are mostly controlled by KNX.

And this, in spite of the fact that it is not easy to prevail against the usual national technologies. Because home network systems are very popular in Korea – for example, systems made by Samsung or LG. Dana Corp., with hitherto 30 completed projects, is an experienced and competent KNX system integrator in Korea, and was able to convince designers and building owners of the world standard for the ‘intelligent home’.

Consistent appearance of operating units
One argument for the KNX building system technology was the multi-functionality of the bus buttons. This means that residents only need one control unit to switch on and dim the lighting, move and position the blinds and control the room temperature. Another convincing feature was the effective conservation of energy through single room control – even more so as this could be implemented within an overall uniform design. This comprises a large selection of aesthetically pleasing switch designs and is another advantage of KNX amongst worldwide competition. The timeless Berker K1 program is a perfect match for the bright and modern living environment.

Integrated home network system
The building, with its 18 apartments on nine levels and underground car park, is equipped with modern building services; it features a passenger lift, gas boiler for under-floor heating and hot water supply, air conditioning units, solar screening system and safety technology for fire alarm and intruder protection. The KNX controls for lighting, blind control, curtains, heating distribution, hot water circulation and clothes dryer are designed as island installations. Thanks to the open protocol, it was possible to integrate LCD touch panels that are typical for the country in order to allow comfortable central operation via KNX/RS-485 gateways. These can be used to call up operating and control menus for the different installation elements. In addition, residents can use the Home Network Server to set and control pre-set functions for lighting (on/off), blinds (half/full), ventilation and air conditioning units and even the gas valve from their mobile phone or laptop.

Active throughout Korea
Since its formation in 2007, the eight-person team at Dana Corp. has been implementing KNX projects for single family homes, luxury villas and commercial premises. It covers all services connected with KNX building system technology: consultancy, support for design and installation, project design, import of components, construction of distribution boxes, programming, commissioning and customer service.

Benefits provided by KNX in this project
• A large selection of switch ranges and uniform design of KNX operating units such as switches, dimmers, temperature controls, blind switches and other installation elements such as sockets, communication connectors etc.
• Central operation via LCD touch panel and remote access via mobile phone and laptop.

Technical refinements
• The interface between KNX and a local RS-485 Home Network System is unique for Korea. This means that KNX functions for lighting, blind system, air conditioning units and heating can be operated and controlled from one unit.

Companies involved
Building owner: Mega Mark, Seoul
Architect: Highlife, Seoul
Services Engineers: Mega Mark, Seoul
HLK Installer: Samil ENG, Janghang
KNX System Integrator: Dana Corp., Seoul,
Mr. Moon S. Park www.danco.com
Multimedia with ECO Mode

Los Angeles: prominent residence with intelligent building technology

An exclusive residence with a 1,900 m² home nestled in the quiet Los Angeles hills: This substantial home includes six suites, two living areas, a theatre room, two game rooms, a wellness landscape with waterfalls, pool, sauna, fitness gym and a basketball court outside. It stands to reason that such a building complex relies on intelligent building control technology. The choice of KNX confirms once again the advantages of this world standard for certified and compatible components. This is precisely the solution with which designer and system integrator Benolli Smart Systems in Los Angeles, USA, was able to meet the customer’s wishes for high comfort, exciting design and energy efficiency. The KNX installation for the comfortable home and guesthouse of the famous HOF baseball player Eddie Murray in Los Angeles, California, impressed the jury sufficiently, leading them to select it for the KNX Award International Africa/America/Australia. This project includes all applications that are typical for upscale installations in private residences, almost in the manner of a showroom: comfortable lighting, automatic solar screening, energy-saving control technology, media technology, security monitoring and central operating touch panels with exclusive visualization.

High degree of lighting comfort

The numerous preset scenes, which can be used to transform the interior and exterior into changing light moods are an example of what can be done with modern artificial lighting. There are buttons for room, house and event scenes, for coming and going, and scenes for daytime and nighttime operation as well as an Eco mode. To this end, the installation includes 220 lighting circuits with dimmer, switching and LED functions. For example, the energy saving mode switches the exterior lighting via a timing program and uses a brightness level of 40 percent. When the lights are activated, for example by a movement sensor, dimmers increase the brightness level. In the bathroom facilities, presence sensors activate the lighting on demand. The operation via the graphic user interface is very comfortable and can be accessed by iPhone, touch panels and from a PC.

Efficient in Eco mode

The automatic solar screening reacts to time switching, scenes, solar sensor and to Eco or absence scenes, wherein the blinds are generally closed. Individual room temperature control for heating, ventilation and air conditioning contributes to energy efficiency, using adjustable operating modes, automatic temperature profiles, window contacts and a link with the scene control system. In addition, an energy management function is activated in Eco mode which operates lighting, solar screening, pool heating and ventilation, and air conditioning more efficiently using dimmer functions, lower target settings and shading.

Appealing user interface

KNX controlled monitoring functions take care of security; for example, using movement sensors, door and window contacts and video cameras. Panic functions are also included. A high performance multi-room control for audio and TV with 16 zones and comfortable entertainment technology streams music to all rooms. The fixed installed touch panels of varying sizes with exclusive visualization client communication features etc. for different events and uses, and mobile operation options.

Benefits provided by KNX in this project

- The system facilitated the installation of numerous interesting features for this ‘intelligent home’ and the integration of other systems so that all functions and media can be controlled and operated via one visualization.
- An energy management system for lighting and temperature control, which is activated via the Eco mode, ensures a reduction of about 20 percent of energy consumption for lighting, space heating, solar screening and pool heating.
- Comfortable lighting with pre-programmed lighting scenes for different events and uses, and mobile operation options.

Technical refinements

- Dynamic and interactive user interface with attractive graphics, operating and configuration options, web services such as weather forecast, email, Google Maps etc.
- Interfaces for Mac, Windows and Linux which are independent of operating systems
- Pre-settable and modifiable scenes for lifestyle, Eco mode, nighttime and daytime operation etc.
- Bi-directional KNX/RS232 interfaces with the swimming pool technology for the control, display and setting of water temperature, target settings, PH value, control of the water features etc.
- Control of gas valves for six fireplaces.

Participating companies:

Building owner: Eddie Murray, Los Angeles, California USA
Architect: Design Control Inc., Culver City, USA
Services Engineers: Benolli Smart Systems, Los Angeles, California USA www.benolli.com info@benolli.com 866.424.3444
Heating/ventilation/air conditioning: Carrier, USA
KNX System Integrator: Benolli Engineering Group, Los Angeles, California USA
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 achieved energy efficiency.

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, Gebäudetechnik Schumann, D-99091 Erfurt
Any higher-spec car contains significantly more technology than your average home. That is surprising, as modern electrical technology has fully developed systems and components for domestic installations which make life more comfortable and secure, and help conserve energy. Somebody owning a ‘home on wheels’ can make use of many functions in his vehicle which make sense at home.

For this reason, when the team of the KNX User Forum Germany tackled this unusual project, it decided to upgrade the functions of a camper van with KNX. They even integrated an on-board computer for which they used a Gira Homeserver. This unusual idea impressed the jury so much that it honored the project with the Publicity Award. The imaginative creators of the first KNX camper van, Günther Sumser, Markus Schwarz and Matthias Schmid, scored special points for their clever comfort, security and energy management functions.

**A holiday is when everything works automatically**

In a way, the KNX camper van is even more functional than an intelligent home. This does not mean that mobile operation using a touch panel and sensors is really new. All functions can also be viewed and controlled externally via the internet. But the control center of the electronic nerve system accomplishes many tasks fully automatically, to an extent that was hitherto not known. Sensors have been installed in the floor, in the bed and the seats of the camper van, which recognize at all times where someone is – the on-board computer will then automatically switch on the respective lights. If somebody gets up at night, the light comes on and is also dimmed. The central intelligence also detects meal times: if somebody sits down on one of the armchairs in the dining area, a pre-programmed lighting scene is called up. When the TV mode is activated, the flat screen moves out, the SAT system automatically aligns itself and the blinds are lowered if the sun is shining outside – and so on. A real holiday feeling! There is not enough room here to list all the creative functions.

**Endurance test on Europe’s roads**

People travelling in the camper van will also appreciate improved security functions. When the intruder alarm system is set, the automatic control of lighting and blinds is also activated. Alarm messages can be received by telephone provided a potential intruder even considers breaking in, because there is also a programme simulating the presence of persons in the vehicle. It goes without saying that the on-board computer displays tank levels and manages the power supply from a solar system and batteries.

However, the system integrators were not only concerned with finding useful functions for the camper van, but also wanted to test the behavior of KNX components while on the road. The ProLiner Classic 760 S MEB is said to have travelled 22,000 km on Europe’s roads without a single equipment failure. This compact ‘luxury liner’, with its high-specification technical equipment was presented as a prototype at the Caravan salon 2007 trade exhibition. In the future, the manufacturer wants to offer this version as a standard high-end solution.

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**Benefits provided by KNX in this project**

- Everything works automatically: during dinner, when watching television, when going to bed – the lighting with scene control, TV and audio system, blackout and solar screening and even the activation of the monitoring functions during the night and absences.
- Improved security on the road through intruder and theft prevention and remote monitoring.
- Helpful functions for everyday camping, such as fill level monitoring and alarms, energy management, window and door monitoring, and recording the overnight camp sites using coordinates on a visualization page.

**Technical refinements**

- Automatic control and manual operation.
- Visualization via touch panel, iPhone etc.
- Gira Homeserver as on-board computer.
- TV and audio control linked to the KNX system.
- Central switch functions such as setting the alarm, sleeping mode, absence mode.
- Blinds automatically controlled by the weather station.
- Video monitoring and alarm function.
- Presence simulation during absence

**Camper van team**

- **Design and system integration:** Günther Sumser, Freiburg
- **Communication technology:** Markus Schwarz, Radolfzell
- **LED lighting, solar screening controls:** Matthias Schmidt
- **Interface with third-party systems:** Christian Berg, Kiel
- **Software solutions:** Alfred Scherff, Frankfurt/Main
- **Mobile internet:** Michael Grosaikski, Radevormwald
Showroom Vividly Presents Building Automation
System integrator underpins market leadership in southern Russia with KNX showroom

An impressive exhibition of the equipment available helps potential customers to acquire information and make their decision. In building technology this concerns not only the appearance of switches, operating elements, displays etc. but also the functionality of the equipment. The new showroom of the BIS group of companies in Rostov-on-Don is the ideal information source for customers. The KNX jury felt that the Publicity Award should go to them.

The BIS Group for Engineering and Integration was founded in 1993 and is one of the leading suppliers of building automation in southern Russia. Since 2005, the first projects were residential buildings where specialists installed proprietary home automation systems. After recognizing that the limited conduction capacity of these systems could no longer cope with the ever-increasing customer requirements, BIS has been concentrating on the KNX building system technology. For the purpose of informing customers and other parties, the company used a 200 m² space to install and illustrate various systems which are based on state-of-the-art technology by international market leaders.

Experiencing modern lighting comfort
The BIS Group opted for KNX because the system is open and flexible, meets increasing demand in residential and commercial developments, can be used for various different functions, and because the market provides suitable components and systems by different manufacturers. The idea was to demonstrate these advantages in the showroom. With products by the system suppliers ABB, Gira, Berker, Busch-Jaeger and other manufacturers, the trends and advantages of building automation are very clearly displayed. For example, visitors can experience move the advantages of modern lighting comfort themselves by operating design buttons, sensor operating panels, touch displays or remote-control units to create interesting lighting scenarios. Or they can just walk through a room and experience how lighting is automatically switched on and off. A model of a heating and air conditioning system demonstrates, with colourful neon tubes, how to conserve heating and cooling energy with automatic room temperature control.

A multi-room control system with a comfortable operating element and a representative touch screen invites customers to create the music backdrop they want anywhere in the house and at the same time, use the controls to enhance the mood with lighting scenes.

An impressive switch and control center
The showroom also offers solutions for security scenarios. Examples are sensors and video cameras to monitor spaces or the integration of biometric access control. Finally, all of this is linked to a central display unit. The monitor displays all functions of the simulated building automation which are represented by colored symbols and which are easy to control and operate by touch. Equally impressive for customers are internet functions such as email, news, weather reports, internet TV and radio.

The BIS Group’s latest press release is indicative for the Group’s marketing activities for building automation. Here the management states that the award is a clear indicator of the competence of the company and further confirms its market leadership in the region.

Advantages of KNX for building automation as stated by the BIS Group
• Flexibility and multifunctionality
• Compatibility between products by different manufacturers
• Open for other systems
• Integration of different building functions such as lighting, heating, ventilation and air conditioning, solar screening etc.
• Can be linked to a higher-level building management system

Technical refinements in the showroom
• One of the impressive technical highlights is the visualization on a touch panel with layout drawings and views of rooms, color coding for different functions, options for control, dimming and switching, options for creating scenarios by controlling the lighting and window blinds, including central and decentralized operation, multi-room control, internet functions, video monitoring and display of consumption data.

Participating companies:
Building owner, designer and KNX system integrator: BIS Group, Rostov-on-Don, Russian Federation, homepage: www.bisrostov.ru
Superlative Holiday Resort
Future-proof KNX concept guarantees growth and flexibility

Lovers of luxurious holidays will now find their paradise in one of the most beautiful holiday regions of Greece. The first part of the Navarino Resort in the southwestern Peloponnese was opened in time for the 2010 season. Two hotel complexes with 766 rooms and suites, 265 private pools, a golf course, sports, spa and therapy facilities and conference rooms await the visitor. A total of 750 staff are ready to spoil their guests. You only need to imagine the white sandy beaches, the turquoise color of the lagoons, the Greek sun and shady woods – and your dream is perfect.

The KNX system installed at the resort can boast similar superlatives: to organize 6,000 KNX units, 190 main distribution points, 16 zones, 198 lines and 18,000 group addresses was a considerable challenge for the system integrator GDS Digital System LTD – not least because this had to be accomplished taking into account the planned expansion of the complex to four times its current size by 2015. Unless a future-proof concept had been found, the KNX system would have been stretched beyond its limits in trying to accommodate the expanding building services. This was all of this reason for the jury to select the project for the Special Award.

Guarantee for energy efficiency, comfort and security

Environmental protection is of great importance in Navarino: trees were uprooted and replanted, water cisterns were built, solar collectors installed etc. The plan right from the beginning was also that the resort should be operated with zero emissions.

By controlling air and monitoring the automatic conditioning system, controlling and dimming the lighting system automatically in accordance with demand and activating cooling and shading functions at the right time, KNX makes a contribution. In addition, KNX ensures comfort and security. Lighting scenarios can be called up to bring about the desired lighting mood, sensors control the lighting of the building and media control. KNX also ensures that conferences run smoothly and, through the integration of fire alarm and evacuation systems, it is possible to trigger the correct building services functions in emergencies. Likewise, remote control and maintenance of the complete KNX system was part of the initial design.

Expansion possibilities with KNX

Central operating and monitoring facilities have been installed in all five receptions. A visualization of the complete installation is used to operate these facilities. In the coordination of all this necessary data, the system integrator has demonstrated his extensive experience with KNX. In order to manage all building services functions centrally, it was necessary to link up the main distribution points with thousands of kilometers of cable. The installation relies on various media, i.e. TP, LWL, as well as, locally, IR and RF. This is managed powerfully via the KNXnet/IP package. In order to maintain an overview of the many items of equipment and functions, subsystems were formed, each with the same group address, which can be distinguished from the center using specially programmed routers. This means that the KNX installation remains open and flexible for further expansion.

Benefits provided by KNX in this project

• Versatile applications for lighting, solar screening and air conditioning.
• Options for managing the whole range of building services centrally.
• Remote monitoring and maintenance.
• Compatibility with different media and protocols, such as twisted pair, optical fiber and KNXnet/IP for coping with large distances.
• System flexibility for coping with changes and expansion.

Technical refinements

• In order to be able to cope with the enormous number of addresses required for the successive expansion of this gigantic KNX project, it was necessary to divide the KNX system into sub-systems. The resulting identical group addresses can be recognised by the visualization at the central merging point of the sub-systems via specially programmed routers. This allows central management with access to all functions.
• Redundant cable installation and power supply increases the availability of the system.

Companies involved

Building owner:
Temes S.A., Athens, Greece
Architect:
Tobazis and Associates, Athens, Greece
Electrical Services Engineer:
Triedros Melititiki S. A., Athens, Greece
System integrator:
GDS Digital System LTD, N.Eritrea, Greece

Ultimately it is also this flexibility which persuaded the designers and clients to opt for KNX. Compared with other systems, the flexible installation and reduced installation time, interfaces with other systems, extensive range of products available, trained technicians and the option for structured programming all spoke for KNX.

The Navarino Resort has one of the most extensive KNX installations in Greece.
Success with Energy Management

Group headquarters reduces the cost of electricity for lighting through automatic KNX controls

It is well known that there is often enormous potential for energy conservation with respect to lighting systems used in industrial companies, offices and public buildings. By using automatic KNX lighting control systems it is possible to reduce the cost of electricity by double-digit percentage figures. This becomes interesting when the first real figures are recorded.

The master server receives all information from the KNX ‘worlds’. This includes data from sensors which are needed for the automatic lighting control systems. Touch panels are available to access the visualization system which was programmed by EIB-TECH.

The success of lighting energy management in the Campeon development was rewarded with the Energy Efficiency Award.

The system integrator, Helmut Lintschinger, of EIB-TECH in Andechs, has implemented a KNX lighting energy management system in the new group headquarters in Munich, called the Campeon, of Infineon Technologies. Prior to the installation, the building featured an exceptionally high consumption of electrical energy.

In the fourth quarter of the 2008/2009 business year alone, the consumption statistics show cost savings of about EUR 31,846 or 20 percent compared to the previous year.

This project – an impressively sized KNX installation with its approximately 10,000 sharing units – was submitted for the Energy Efficiency Award.

In order to combine these into one central management system, the system integrator has formed six KNX ‘worlds’ with one Gira Facility Server each, which communicate with each other via TCP/IP.

**Server calculates artificial lighting times from daylight data**

In 2006, Infineon Technologies moved into its new group headquarters with its approx. 150,000 m² of offices and about 6,500 work places. Owing to the company’s positive experience with KNX, the electric installations were carried out using this system. In 2008, the company decided to implement an energy management system. One of the tasks of the automated functions was to switch off lighting when it was not in use. For this purpose, the data of light intensity sensors are evaluated. Based on the assumption that the daylight levels inside the building are proportional to the light intensity outside, it is possible to calculate the switch-off times via the server. The higher the value in lux, the longer the switched-off phase. This period can be manually optimized by presetting the lux value on the display. During the busiest periods at the beginning and end of the working day, the automatic switch-off facility is deactivated. Outside business hours the lighting is switched off via a timing programme. To safeguard against accidents, a pre-warning function with lights flashing three times was provided for stairwells. Similar energy-saving functions were programmed for the toilets and ancillary rooms.

**Flexible for further optimization**

The success of this measure soon became apparent through the reduction in electricity consumption. For this reason, Infineon Technologies decided on a second stage of the lighting management system which included areas such as underground car parks, meeting rooms, rest areas and even kitchenettes. The lighting in these areas is switched off at 10:00 pm – this ensures that the light does not stay on continually.

The company management has announced further measures for conserving energy used by the building services.

**Benefits provided by KNX in this project**

- Installation of a light energy management system using decentralized bus units and one central server.
- Substantial savings on lighting costs through automated switching.
- Owing to the flexibility of the system it is easy to implement further energy management optimization measures.
- Large selection of compatible bus sharing units for many different functions by different manufacturers.

**Technical refinements**

- Networking of six independent zones / KNX ‘worlds’ using six Gira Facility Servers. The master server evaluates and documents the data and carries out the control functions.
- All KNX functions are graphically displayed and controllable via touch panels and personal computers.
- Control of different building services such as solar screening, shutters, SHE and car park control systems.

**Companies involved**

- **Building owner:** Infineon Technologies AG, Munich
- **System integrator:** Helmut Lintschinger, Andechs

**www.eib-tech.com**
A prizewinner, even before the work has been completed? The jury for the KNX award was already enthusiastic about just the idea that pupils from six European countries intended to develop an ‘intelligent home’, based exclusively on their own ideas. Further, the activities would not only include the functions of the home, but also the marketing and – in connection with that – a market analysis.

In 2008 six vocational colleges from Belgium, the Czech Republic, Finland, Germany, Italy and Hungary started the ‘Smart Home in Europe’ project – as part of the Comenius EU learning program. The 200 participating students set themselves the goal of developing useful functions in a networked house of the future. For this purpose, each formed team took on a special task. In their search for the right technology, they discovered KNX because the system can cover all applications in the house and represents an international standard which is recognized in all participating countries – that means that KNX also has a unifying aspect, which is particularly appropriate for a European teaching project.

Promoting the idea of ‘Smart Houses’ to the general public and politicians

The Comenius school partners are supported by the EU Commission and link teachers and pupils from different participating countries to join in shared activities over a two year period. Initial meetings about the ‘Smart Home in Europe’ took place in Recklinghausen (D), Koke-mäki (FIN), Békéscsaba (H), Modena (I), Pilsen (CZ) and Genk (B). These served not only to determine the division of labor but also to gather basic knowledge. This led to the conclusion that ‘Smart House’ technologies are still largely unknown to large parts of the population. So there is a task for the marketing team: the future commercial assistants of the Kuniberg vocational college in Recklinghausen assume that the demand for ‘Smart Homes’ will increase, particularly amongst older people, although currently there are not enough political or commercial incentives. Their idea: a campaign to bring the idea of helpful functions, safety and energy efficiency in one’s own home to the public and hopefully also to representatives of the political parties.

Saving energy with lighting

A first technical application was implemented at Kokemäenjokilaaksan ammattikoulu in Finland. The lighting system of their own classroom is controlled via KNX/DALI, including dimmer function and lighting scenarios, and is intended to increase the awareness of artificial lighting and the need and potential for saving electrical energy. In addition, the solar screening system, black-out system and screen were linked up to automatic KNX operation, which includes a visualization representing the functions. The pupils received support with equipment from BEMI-automation (specialist for lighting design in Vaasa, general manager Micheal Bendtsen), Somfy Group (world leader in window motorization and control), Ulvilan Kaidhink (local producer of Venetian blinds), Berker and Wago. As a result, BEMI automation has designed very modern lighting for the classroom using the latest findings of psychology on illumination and the most modern instruments of KNX.

Further projects are underway: The Technische Instituut St. Lodewijk in Belgium and the Istituto Tecnico Industriale Statale ‘Fermo Corni’ in Italy work on solutions for conserving energy. Students of the Békéscsaba Central Vocational School and Student Hostel, Békéscsaba in Hungary work on audio and video control systems. And a team of budding electricians at Vyšši Odborná Škola a Střední Průmyslová Škola Elektrotechnická Plzeň, Koterovska 85, 32600, Pilsen, Czech Republic works on the communication technology in ‘Smart Houses’.

Benefits provided by KNX in this project

In this teaching project, pupils take the lead in designing their own ‘Smart Home’ of the future. Their ideas and creative solutions are a good match for the international KNX standard due to its many functions, its large selection of compatible components and brands and the international applicability of the system.

Participating institutions

Technische Instituut St. Lodewijk
Mosselerlaan 110, 45665 Recklinghausen, Germany
www.tisl.be
Project coordinator: Robert Gabriëls

Kokemäenjokilaaksan ammattikoulu
Koterenkatu 4, 32801 Kokemäki, Finland
www.kuniberg-berufskolleg.de
Project coordinator: Robert Gabriëls

Istituto Tecnico Industriale Statale ‘Fermo Corni’
Sede Largo Aldo Moro 25, 41100, Modena, Italy
www.itscorni.it
Project coordinator: Enrico Artioli, Cecilia Lombardi

Békéscsaba Central Vocational School and Student Hostel
5600 Puskin tér 1, Békéscsaba, Hungary
www.bekszsi.hu
Project coordinator: László Kruzsics

Vyšši Odborná Škola a Střední Průmyslová Škola Elektrotechnická Plzeň, Koterovska 85, 32600, Plzen, Czech Republic
www.spse.pilsedu.cz
Project coordinator: Karel Hajzman

Companies involved to date:

BEMI, Vaasa, Finland
Somfy Group, Finland
Ulvilan Kaidhink, local producer of Venetian blinds, Finland
Hager Modulec NV, Anderlecht, Belgium
The worldwide STANDARD for home and building control

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www.knx.org