



WEDNESDAY, 8TH APRIL 2020.

KNX Home and Building Automation

ABB i-bus KNX



KNX Smart Home and Intelligent Building Technology

An introduction to KNX – Welcome to a smarter tomorrow



KNX Smart Home and Intelligent Building Technology

Agenda

- **What/who is KNX?**
- **KNX History**
- **KNX Philosophy**
- **KNX Interoperability**
- **KNX Application Areas**
- **KNX Energy Efficiency**
- **KNX Projects**

KNX Smart Home and Intelligent Building Technology

What/who is KNX?

KNX Smart Home and Intelligent Building Technology

An introduction to KNX

The demand for comfort and versatility in the management of heating, lighting and access control systems for a family home as well as an office complex is growing. At the same time, the efficient use of energy is becoming increasingly important. People want a comfortable, sustainable and safe place to live and work and that's where automation jumps in.

Increased convenience and safety together with lower energy consumption can only be achieved using intelligent control and monitoring of all products involved. This is a true challenge as it implies more wiring for sensors and actuators to control and monitoring centres. For professionals, such a mass of wiring also means higher design and installation efforts, increased fire risk and soaring costs.

That's where KNX jumps in!



KNX Smart Home and Intelligent Building Technology

Realizing the automation dream

Automation doesn't have to be difficult. It requires a system that does away with the problems of isolated devices by ensuring that all components communicate via one common language.

The kind of device you want to use doesn't matter anymore.

Whether you want to control lighting, shutters, security systems, energy management, heating, ventilation... all functions work one system.

This is the principle of interworking.

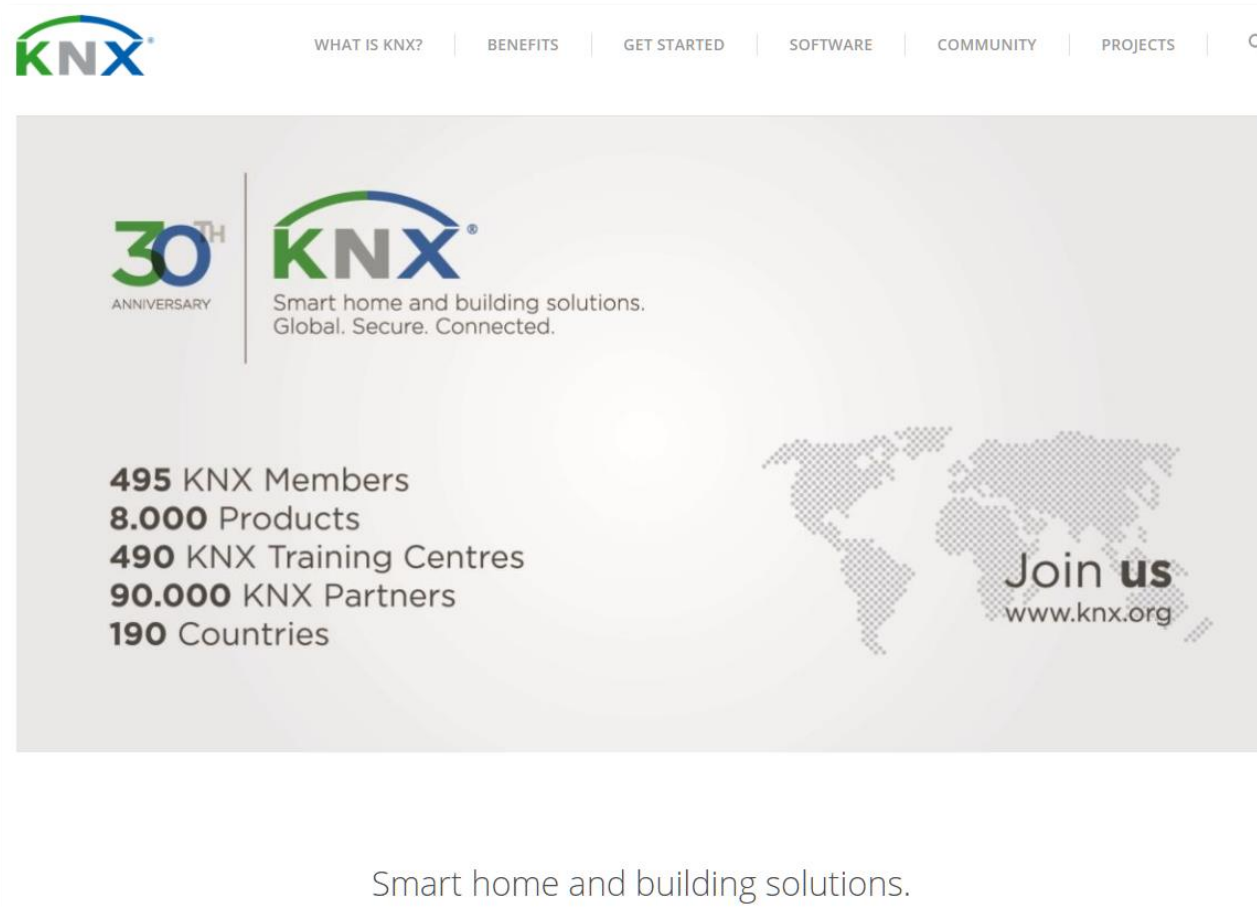
This is home and building control made easy.

This is KNX!



KNX Smart Home and Intelligent Building Technology

KNX Organisation

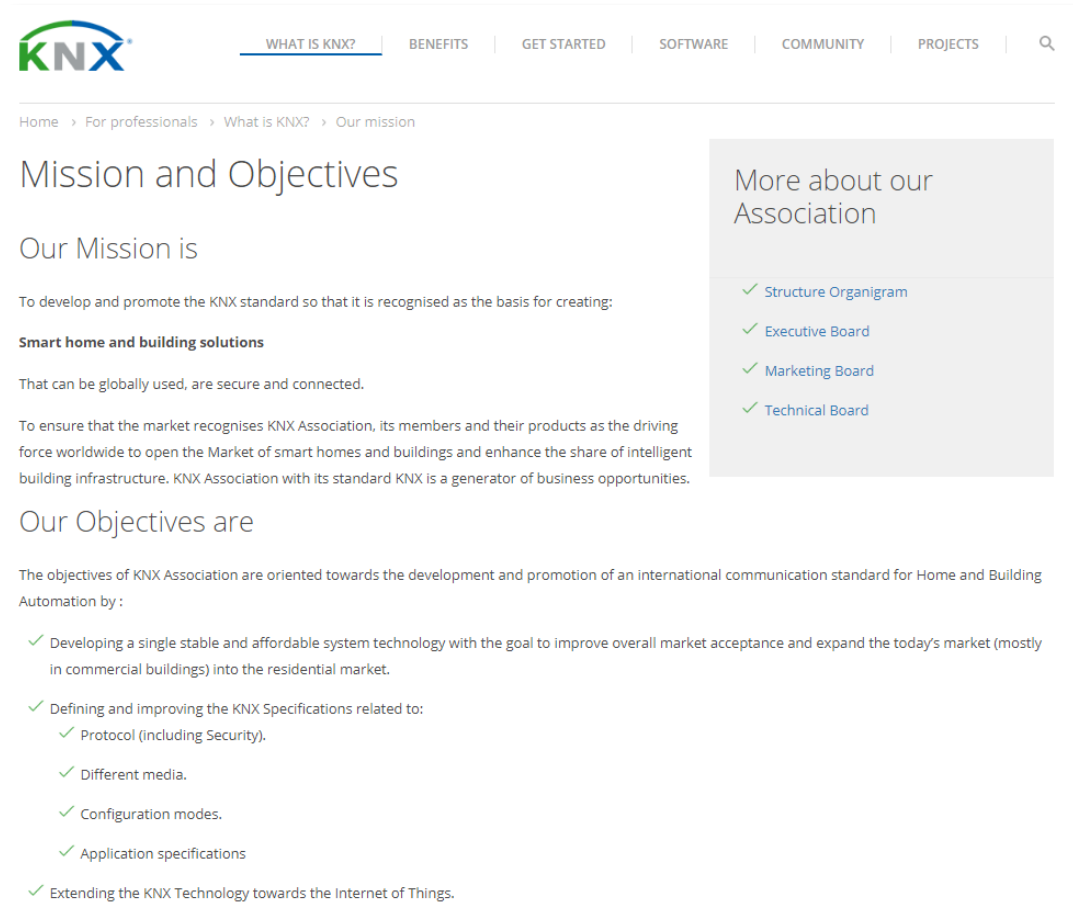


The screenshot shows the KNX website homepage. At the top left is the KNX logo. To its right is a navigation menu with links: WHAT IS KNX?, BENEFITS, GET STARTED, SOFTWARE, COMMUNITY, and PROJECTS. A search icon is on the far right. The main content area features a large banner for the 30th anniversary. On the left of the banner is the text '30TH ANNIVERSARY'. To its right is the KNX logo and the tagline 'Smart home and building solutions. Global. Secure. Connected.' Below this, a list of statistics is displayed: 495 KNX Members, 8.000 Products, 490 KNX Training Centres, 90.000 KNX Partners, and 190 Countries. On the right side of the banner is a world map and the text 'Join us www.knx.org'. At the bottom of the banner, the tagline 'Smart home and building solutions.' is repeated.

www.knx.org

KNX Smart Home and Intelligent Building Technology

KNX Organisation



The screenshot shows the KNX Association website. The navigation bar includes links for 'WHAT IS KNX?', 'BENEFITS', 'GET STARTED', 'SOFTWARE', 'COMMUNITY', and 'PROJECTS'. The breadcrumb trail is 'Home > For professionals > What is KNX? > Our mission'. The main heading is 'Mission and Objectives'. The text states: 'Our Mission is To develop and promote the KNX standard so that it is recognised as the basis for creating: **Smart home and building solutions** That can be globally used, are secure and connected. To ensure that the market recognises KNX Association, its members and their products as the driving force worldwide to open the Market of smart homes and buildings and enhance the share of intelligent building infrastructure. KNX Association with its standard KNX is a generator of business opportunities. Our Objectives are The objectives of KNX Association are oriented towards the development and promotion of an international communication standard for Home and Building Automation by:

- ✓ Developing a single stable and affordable system technology with the goal to improve overall market acceptance and expand the today's market (mostly in commercial buildings) into the residential market.
- ✓ Defining and improving the KNX Specifications related to:
 - ✓ Protocol (including Security).
 - ✓ Different media.
 - ✓ Configuration modes.
 - ✓ Application specifications
- ✓ Extending the KNX Technology towards the Internet of Things.

On the right side of the page, there is a sidebar titled 'More about our Association' with a list of links:

- ✓ Structure Organigram
- ✓ Executive Board
- ✓ Marketing Board
- ✓ Technical Board

www.knx.org

KNX Smart Home and Intelligent Building Technology

KNX Australia Organisation



ABOUT US | EXPLORING KNX | MEMBERS & PARTNERS | NEWS | PROJECTS | TRAINING | CONTACT US | 🔍

WELCOME TO KNX AUSTRALIA

The worldwide standard for home and building control, adopted by Standards Australia as a technical specification.

www.knx.org.au

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KNX Australia Organisation



The image shows a grid of five navigation cards for the KNX Australia website. Each card has a header image, a title, a short description, and a button with a right-pointing arrow.

- PROJECTS**: Australia features some of the world's most outstanding KNX projects. Including some International Award Winners. Button: VIEW PROJECTS →
- TRAINING**: KNX Australia offers introductory and certified courses around Australia. Check upcoming training courses. Button: CHECK DATES →
- WHAT IS KNX?**: The standard has been eagerly adopted by many international manufacturers who together provide a vast array of KNX-certified products. Button: DISCOVER MORE →
- 2018 KNX Journal 2**: The latest KNX journal, about maximum protection for smart homes and buildings. Button: DOWNLOAD JOURNAL 📄
- KNX Secure**: A graphic featuring a large padlock with the KNX logo and the word 'SECURE' on it, set against a background of blue and red digital data patterns.

www.knx.org.au

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KNX History

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KNX History

Before 1997: Three major bus associations in Europe

1. **Batibus: Bus medium originally developed by Schneider Electric – especially successful in France**
2. **EIBA: Especially successful in German speaking countries – owner of the common design & commissioning tool ETS**
3. **EHSA (European Home Systems Association): Association resulting from a European project for automatic configuration of bus compatible white (washing machine, ...) and brown (video, ...) goods**

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KNX History

- **EIBA - European Installation Bus Association**
- **Was found on 8. May 1990 in Belgium (by manufactures of installation devices)**
- **Organisation across Europe for all companies developing and manufacturing EIB products**
- **Bus technology based on a common European concept**
- **The aim was to provide a Bus System with fully compatible devices providing a high degree of interworking → EIB**
- **EIB Tool Software ETS**



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KNX History

1997: Start of the convergence process with the following goals

- Creation of a joint standard for a new bus system “KNX”
 - Based on EIB
 - Extended with configuration mechanisms other than PC based programming, i.e. easy configuration
 - Extended with new media: RF and IP
- European Standardisation of the KNX standard by becoming co-operation partner of CENELEC (European Committee for Electro-technical Standardisation)
- Registration of a new trademark
- Start of a Certification procedure for KNX compatible devices

→ 14 April 1999 : Founding of Konnex Association in Brussels with 9 founding members

KNX Smart Home and Intelligent Building Technology

KNX Association - 495 Members



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ABB's Pedigree in Intelligent Building Control



1983

First bus installation system
SIGMA® i-BUS



EUROPEAN INSTALLATION BUS

1990

Founder Member of the EIBA Association
in Brussels



1992

ABB i-bus® EIB
launched in Germany



KNX Association

1999

Founder Member of KNX
World's first open Standard, Brussels



Today

ABB's involvement in
KNX today

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KNX is 30!



The graphic features the KNX 30th Anniversary logo on the left, the KNX logo with the tagline 'Smart home and building solutions. Global. Secure. Connected.' in the center, and a list of statistics on the bottom left. On the right, there is a world map with the text 'Join us' and the website 'www.knx.org' overlaid on it.

30TH
ANNIVERSARY

KNX[®]
Smart home and building solutions.
Global. Secure. Connected.

495 KNX Members
8.000 Products
490 KNX Training Centres
90.000 KNX Partners
190 Countries

Join **us**
www.knx.org

KNX Smart Home and Intelligent Building Technology

KNX Philosophy

KNX Smart Home and Intelligent Building Technology

KNX Philosophy

- **KNX is an installation bus which provides a cost-effective and flexible solution for a wide range of different tasks in commercial and industrial buildings.**
- **KNX is the world's only open Standard for the control in both commercial and residential buildings, defined by IEC1453-3.**
- **Adopted as SA/SNZ ISO/IEC TS 14543.3.1-6:2018**
- **KNX is controlled by the KNX Association in Europe which ensures the technology is independent of all manufacturers.**
- **KNX devices from different manufacturers are checked for compliance with the standard, registered and certified by the KNX Association. Compliant devices display the registered KNX Logo.**

Future
proof

KNX Smart Home and Intelligent Building Technology

ABB i-bus KNX – The future of Building Control at www.abb.com/KNX

The screenshot shows the ABB i-bus KNX website home page. At the top, the ABB logo is followed by a navigation menu: HOME - OFFERINGS - LOW VOLTAGE PRODUCTS - HOME AND BUILDING AUTOMATION - ABB I-BUS KNX. A search icon and a 'GLOBAL SITE' dropdown are also present. The main heading is 'ABB i-bus® KNX' with the tagline 'Make your buildings smarter'. Below this is a large image of a meeting with people around a whiteboard. A text block states: 'The well-established ABB i-bus® KNX system is available today for the demands of tomorrow. It is based on the worldwide KNX standard and is open for ever increasing demands – for the utmost safety in planning.' The 'Products and Downloads' section features a grid of 18 product categories, each with a representative image and a label: All available products, Power Supply, System infrastructure and interfacing, Connection and Wiring, Room Automation, Inputs, Outputs, Shading Control, Lighting Control, Presence Detection, Heating, Ventilation and Air conditioning, Automation, Logic and Time Control, Visualisation, Display and Signalling, Energy Management, Safety and Monitoring, Security, User Operation - Design Ranges, and Discontinued Products.

The screenshot shows the 'System information' page on the ABB i-bus KNX website. It features a navigation menu at the top and a main heading 'System information'. Below the heading is a row of four large images with corresponding labels: Overview, Advantages, Features, and Installation. The 'Highlights' section contains four smaller images with labels: ABB i-bus® KNX IoT Dashboard, ABB i-bus® KNX Combi Switch Actuators, Busch-VoiceControl® KNX, and BIM. A 'Services & Tools' section follows, with a row of six icons and labels: Engineering tools, Catalogues and brochures, Additional materials, Training and qualification, Project references, and Newsletter subscription. Below this are two more icons with labels: MyBuildings portal and ETS data. The 'Support' section at the bottom has four icons and labels: Engineering guide database, FAQ – Frequently asked questions, News-Ticker, and Local contacts.

KNX Smart Home and Intelligent Building Technology

ABB i-bus KNX – The future of Building Control Product overview

ABB

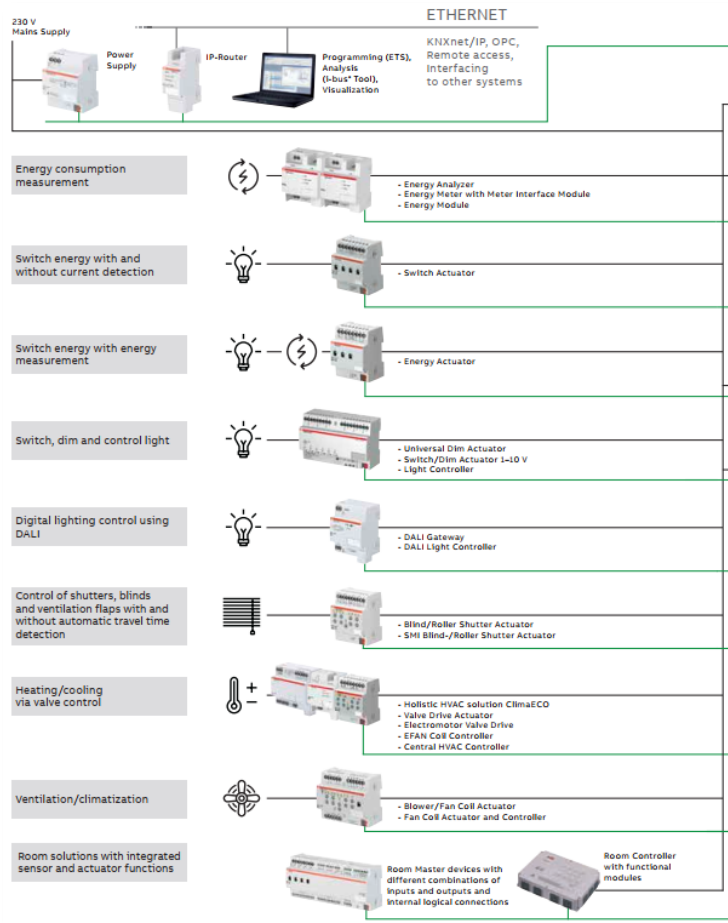


**Smarter Solutions for
Home and Building Automation
ABB i-bus® KNX
Product Range Overview 2019/2020**

Product description, quick and easy
selection of product codes

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ABB i-bus KNX – The future of Building Control



Energy consumption

Switching

- With/without current detection
- With energy measurement

Switch and dim lighting

DALI lighting control

Shutters and blind control

Heating/cooling via valve control

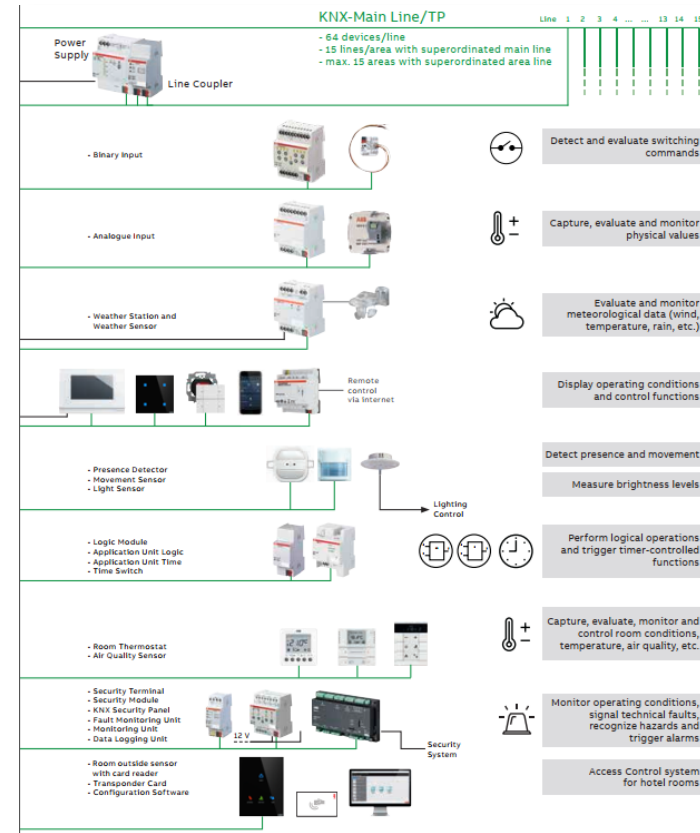
Ventilation/climate control

Room management

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ABB i-bus KNX – The future of Building Control

- Power supplies
- Binary inputs
- Analogue inputs
- Weather sensors
- Presence detectors
- Logic and time control
- Room temperature and humidity sensors
- Security devices
- Hotel access control



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ABB i-bus KNX – The future of Building Control

- **Transmission speed: 9,600 bit/s**
- **Bus access method: CSMA/CA**
- **Symmetrical transmission, high common mode rejection by transformer coupling**
- **Application program and addresses in the EEPROM of the bus coupling units**
- **Program with the Engineering Tool Software ETS**



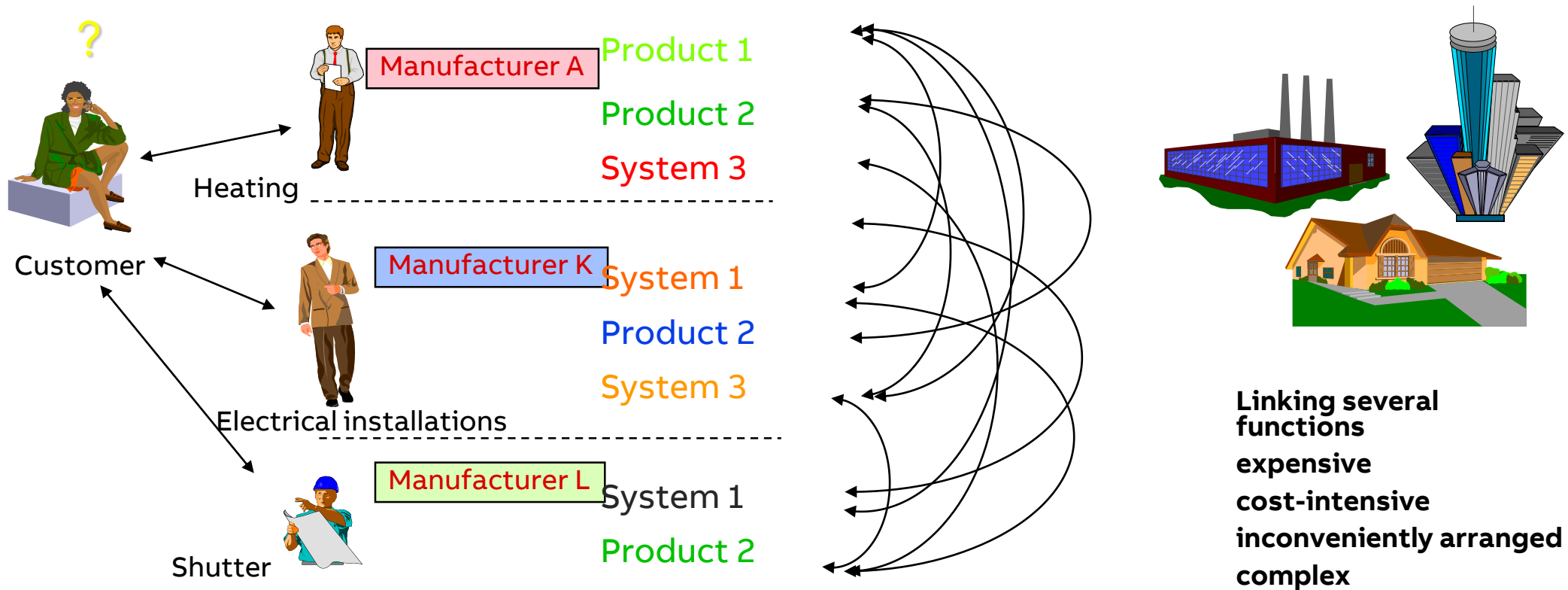
KNX Smart Home and Intelligent Building Technology

KNX Interoperability

KNX Smart Home and Intelligent Building Technology

KNX Interoperability

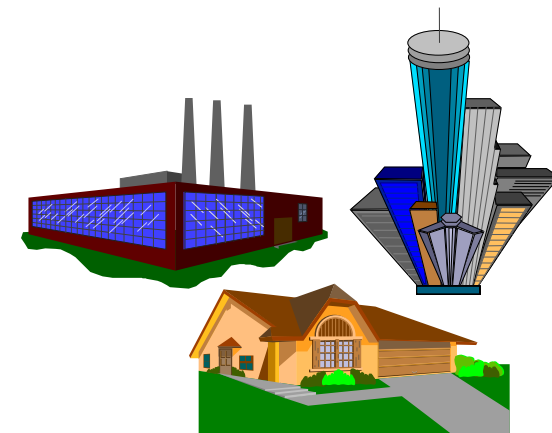
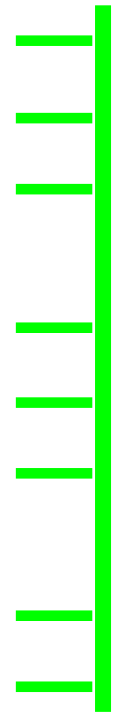
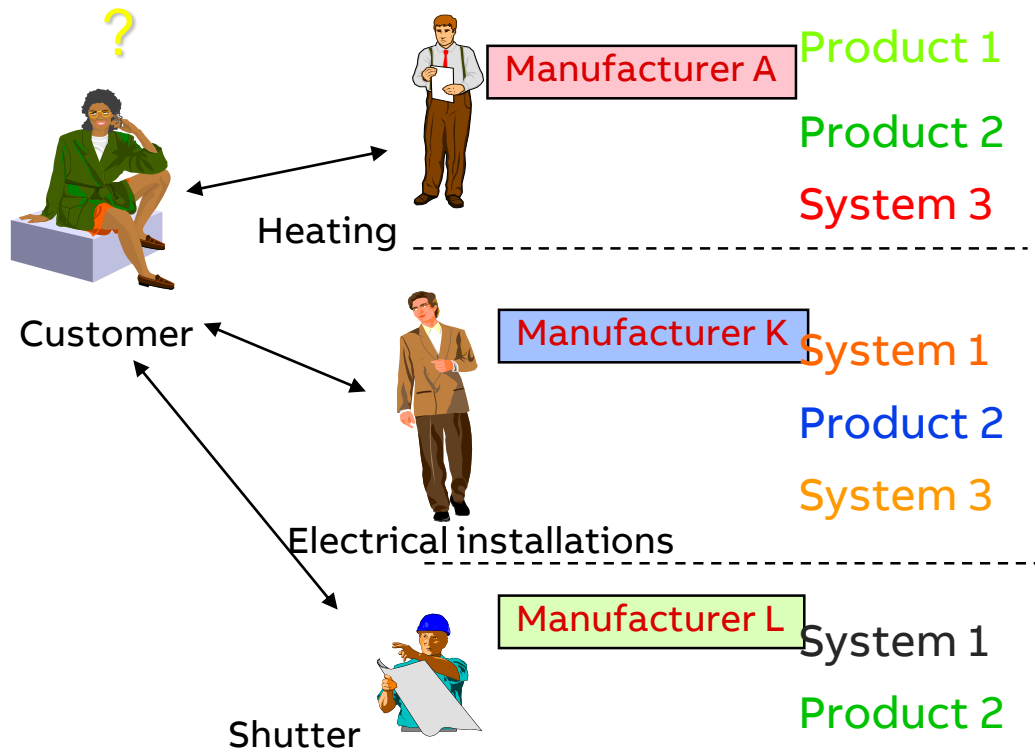
Conventional Installations



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KNX Interoperability

Home and Building Management System with KNX



Linking several functions
expensive
cost-intensive
inconveniently arranged
complex

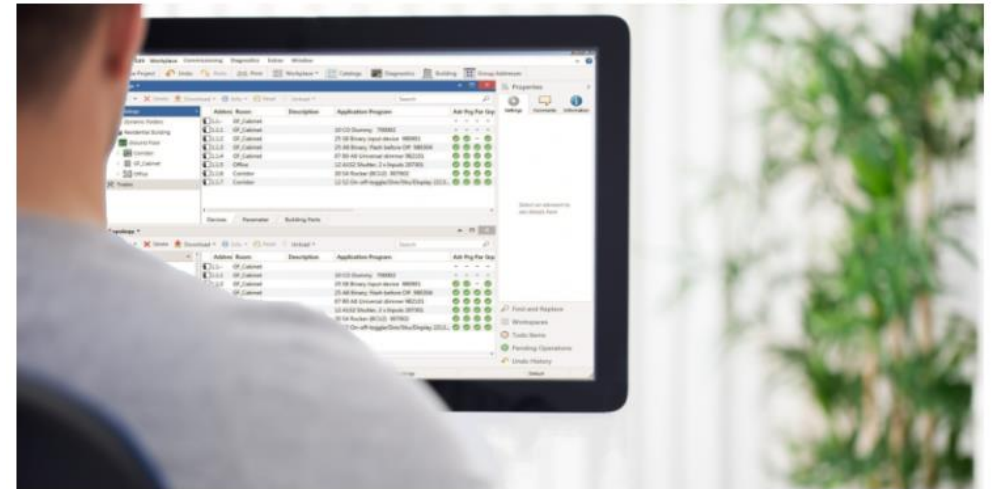
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KNX Interoperability with ETS

ETS stands for Engineering Tool Software. It's a manufacturer independent configuration software tool to design and configure intelligent home and building control installations with the KNX system. ETS runs on the Windows platform.

ETS5 Professional is used to create solutions for all application areas

ETS5 Professional empowers your business – not only technologically, but above all commercially.



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KNX Interoperability with ETS



PROFESSIONAL
5 ETS

The screenshot displays the ETS5 Professional software interface. The main window shows a 'Topology' view with a table of objects. The table has columns for Number, Name, Object Function, Description, Group Address, Length, C, R, W, T, U, Data Type, and Priority. The '1.0.2 SA/S8.10.2.1 Switch Actuator,8-fold,10A,MDRC' object is selected. To the right, the 'Properties' panel shows details for this object, including Name, Individual Address (1.0), and Description. The bottom status bar shows the selected object's IP address: 10.0.83.3671.

Number	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
0	General	In Operation			1 bit	C	R	-	T	-	boolean	Low
10	Output A	Switch	Feature Seating Lighting - SWL...	0/0/1, 1/1/0, 1/2/0	1 bit	C	-	W	-	-	switch, swi...	Low
29	Output A	Status Switch	Feature Seating Lighting - STA...	0/0/2	1 bit	C	R	-	T	-	switch	Low
30	Output B	Switch	Feature Seating Lighting - SWL...	0/0/1, 1/1/0, 1/2/0	1 bit	C	-	W	-	-	switch, swi...	Low
49	Output B	Status Switch	Feature Seating Lighting - STA...	0/0/2	1 bit	C	R	-	T	-	switch	Low
50	Output C	Switch	In Ground Uplights - SWITCH	0/0/3, 1/1/0, 1/2/0	1 bit	C	-	W	-	-	switch, swi...	Low
69	Output C	Status Switch	In Ground Uplights - STATUS S...	0/0/4	1 bit	C	R	-	T	-	switch	Low
70	Output D	Switch	In Ground Uplights - SWITCH	0/0/3, 1/1/0, 1/2/0	1 bit	C	-	W	-	-	switch, swi...	Low
89	Output D	Status Switch	In Ground Uplights - STATUS S...	0/0/4	1 bit	C	R	-	T	-	switch	Low
90	Output E	Switch	GOBO Projector - SWITCH	0/0/5, 1/1/0, 1/2/0	1 bit	C	-	W	-	-	switch, swi...	Low
109	Output E	Status Switch	GOBO Projector - STATUS SWL...	0/0/6	1 bit	C	R	-	T	-	switch	Low
110	Output F	Switch			1 bit	C	-	W	-	-	switch, swi...	Low
129	Output F	Status Switch			1 bit	C	R	-	T	-	switch	Low
130	Output G	Switch			1 bit	C	-	W	-	-	switch, swi...	Low
149	Output G	Status Switch			1 bit	C	R	-	T	-	switch	Low
150	Output H	Switch			1 bit	C	-	W	-	-	switch, swi...	Low
169	Output H	Status Switch			1 bit	C	R	-	T	-	switch	Low

KNX Smart Home and Intelligent Building Technology

KNX Application Areas

KNX Smart Home and Intelligent Building Technology

Application Areas

Fit for all types of buildings

- **With KNX you can combine all kinds of smart home and building solutions to automate and simplify your customer's daily life.**
- **With KNX you are in control!**



KNX Smart Home and Intelligent Building Technology

Application Areas – Lighting Control

Local - Groups - Central – Time controlled – Motion controlled – Event controlled



Triton 5-fold



Dim Actuator



Motion Detector

KNX Smart Home and Intelligent Building Technology

Application Areas – HVAC Control

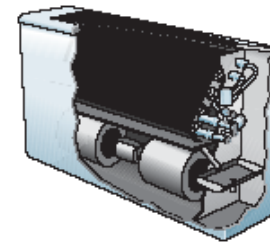
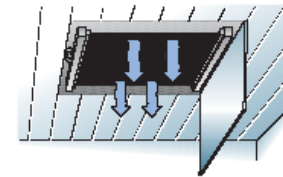
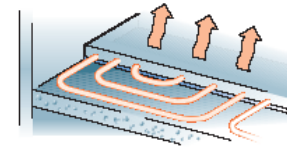
Individual room control – time and remote controlled



Room Thermostat



**Electrothermal or
Electromotorical Valve**



KNX Smart Home and Intelligent Building Technology

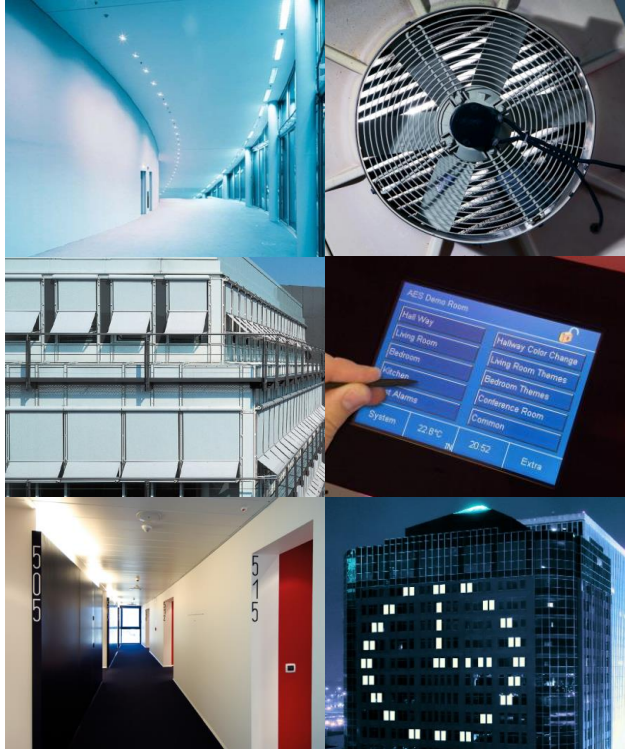
Application Areas – Shutter and Blind Control

Separate - Groups - Central - Depending on sun, rain or wind



KNX Smart Home and Intelligent Building Technology

Application Areas



Lighting control and regulation

Control of heating, ventilation, cooling

Blinds and shutter control

Security and monitoring

Energy and load management

Visualization and operation

Central automation

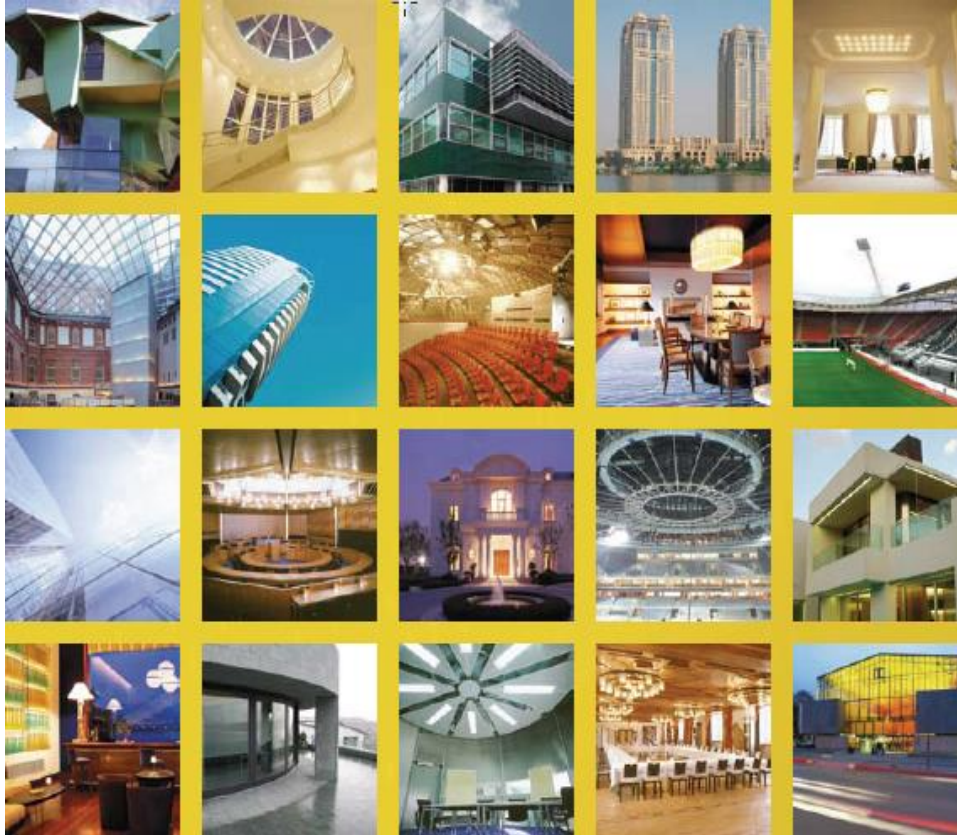
Remote control / maintenance

Interface to other control systems

Presence detection

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Building Types



Office Buildings

Apartments/Villas/Flats

Hotels/Restaurants/Hospitals

Exhibition Centers

Sport stadiums

Museums / Churches

Schools / Universities

Banks

Airports

Industrial Facilities

Shopping centers

KNX Smart Home and Intelligent Building Technology

KNX Energy Efficiency

A lush forest floor covered in vibrant green moss and tree roots. The scene is dense with nature, featuring large tree trunks on the left and a large, moss-covered rock on the right. The ground is a mix of moss, small plants, and fallen leaves.

Yes, we care!

KNX Smart Home and Intelligent Building Technology

Energy savings – light control

- **Time switched control -**
up to 10 % energy savings possible
- **Presence detection -**
up to 20% energy savings possible
- **Presence and brightness detection -**
up to 40 % energy savings possible
- **Constant brightness control -**
up to 50 % savings possible



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Energy savings – blind control

- **Brightness detection -**
up to 13 % savings possible (HVAC)
- **Brightness and presence detection -**
up to 13% savings possible (lighting)
up to 21% savings possible (HVAC)



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Energy savings – HVAC control

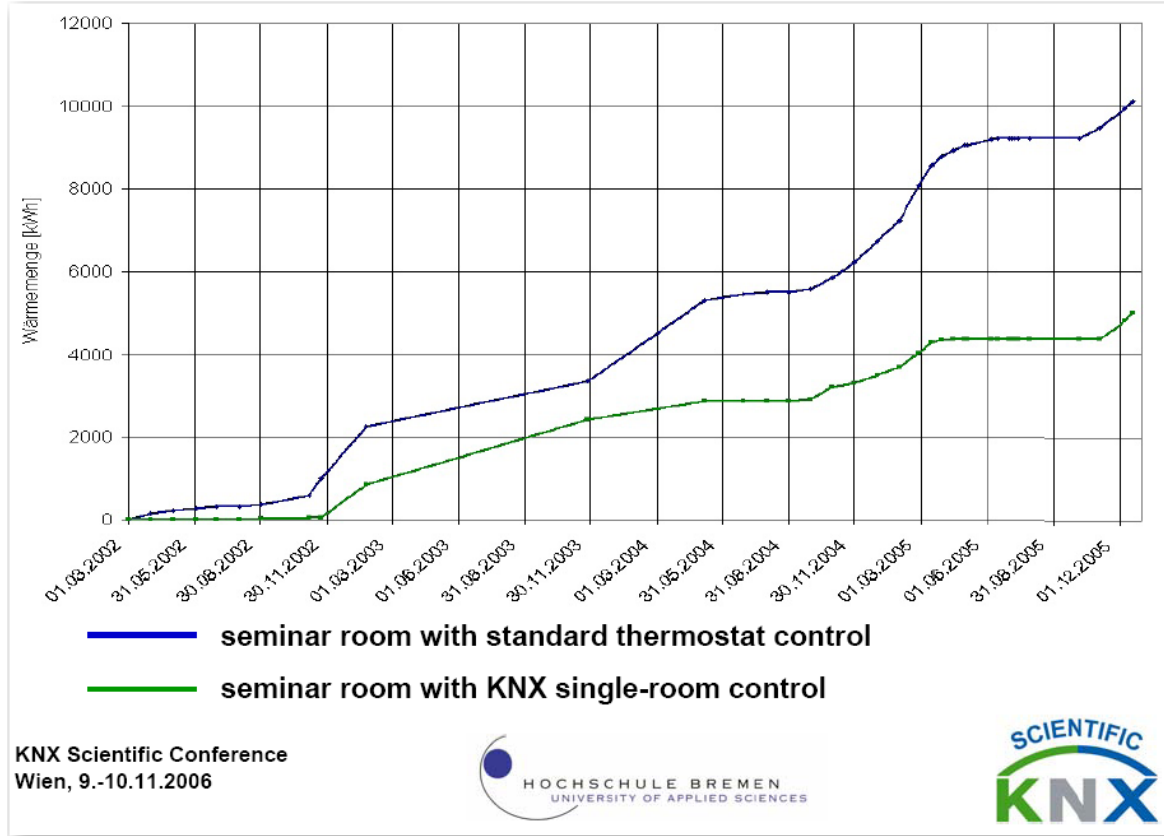
- **Time controlled per room -
up to 10 % savings possible**
- **Presence detection -
up to 25% savings possible**



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Energy savings – University of Bremen

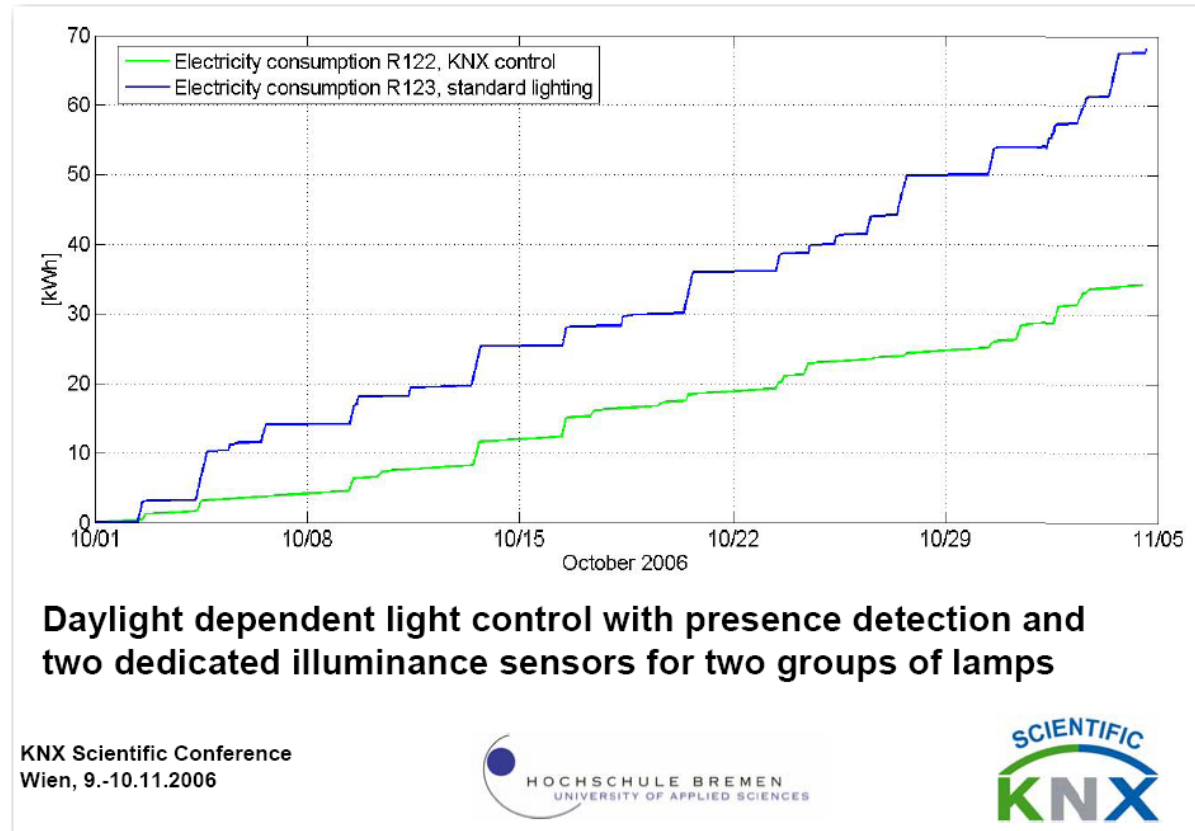
Heating energy usage



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Energy savings – University of Bremen

Lighting energy usage



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KNX Projects

KNX Smart Home and Intelligent Building Technology

Barangaroo



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Monash University New Horizons Building



- **Lighting Control and Regulation:**
 - **Switching**
 - **Central Control**
 - **Time Control**
 - **Day light harvesting**
- **Central Automation**
 - **Complex Logical Operations**
 - **Time Control**
- **Other Applications**
 - **Bacnet interface to BMS**

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NEXT Data center Perth



- **Lighting Control and Regulation:**
 - **Switching**
 - **Time Control**
 - **Day light harvesting**
- **Central Control**
- **Light Scenes**
- **Emergency Lighting**
- **Visualisation**

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15 Green Square Close Brisbane



- **Lighting Control and Regulation:**
 - **Switching**
 - **Central Control**
 - **Time Control**
 - **Day light harvesting**
- **Central Automation**
- **Emergency lighting**
- **Other Applications**
 - **Bacnet interface to BMS**

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City West Police Complex Melbourne



Lighting Control

- Daylight Dependent Switching
- Day light harvesting

Blind and Shutter Control

- Sun Position Dependent Control (Light Steering, Glare Protection)
- Central Control

Operation, Indication and Visualisation

- Visualisation via PC

KNX Smart Home and Intelligent Building Technology

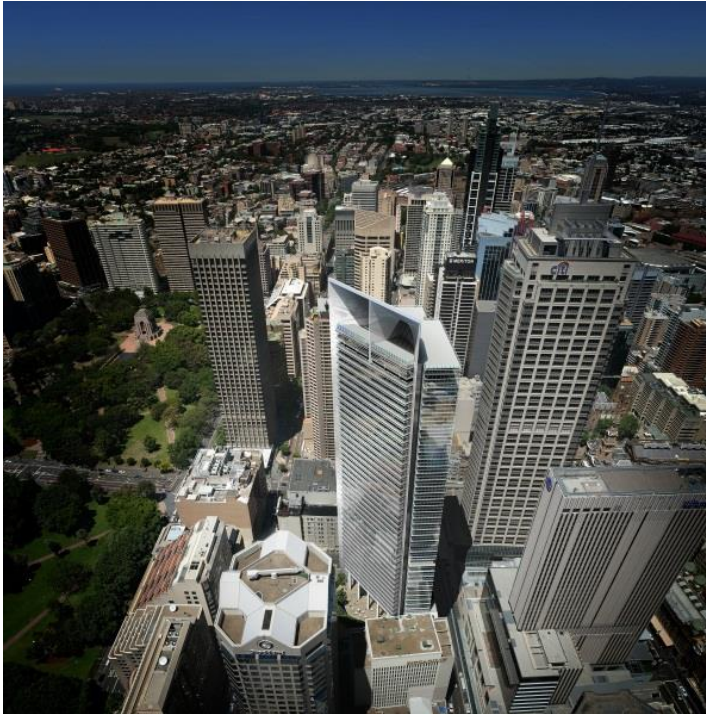
850 Collins Street Melbourne



- **Lighting Control System**
- **Sensor operated daylight harvesting**
- **Bacnet Interfacing to other Building System**
- **Operation, Indication and Visualisation**

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ANZ Tower Sydney



- **Energy efficient lighting control system**
- **Solar shading**
- **Security and interface control**
- **Air conditioning**
- **PV and wind power generation**
- **Smart metering of power and water**
- **Roof mounted weather station**



ABB