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

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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

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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!

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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!

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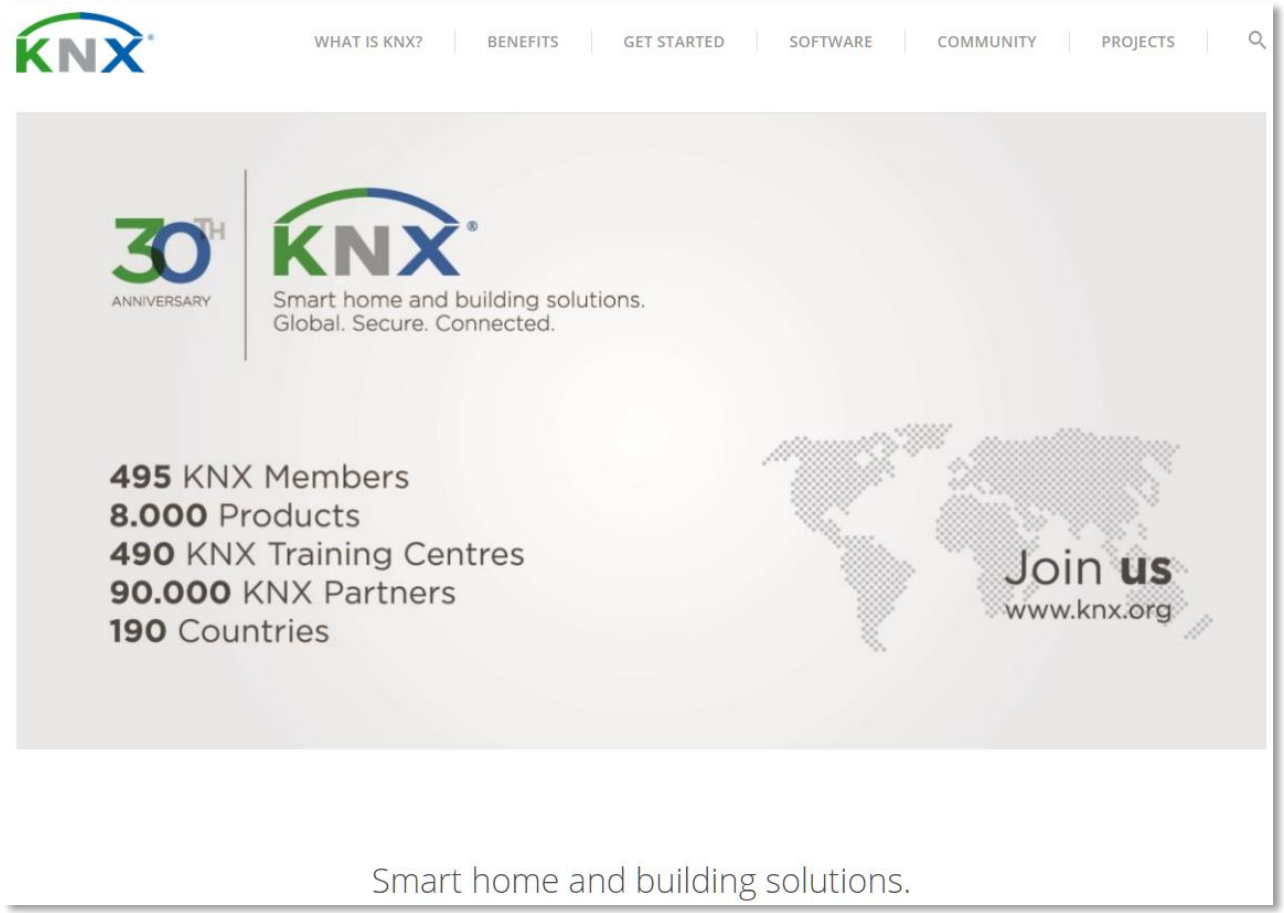
KNX Organisation



www.knx.org

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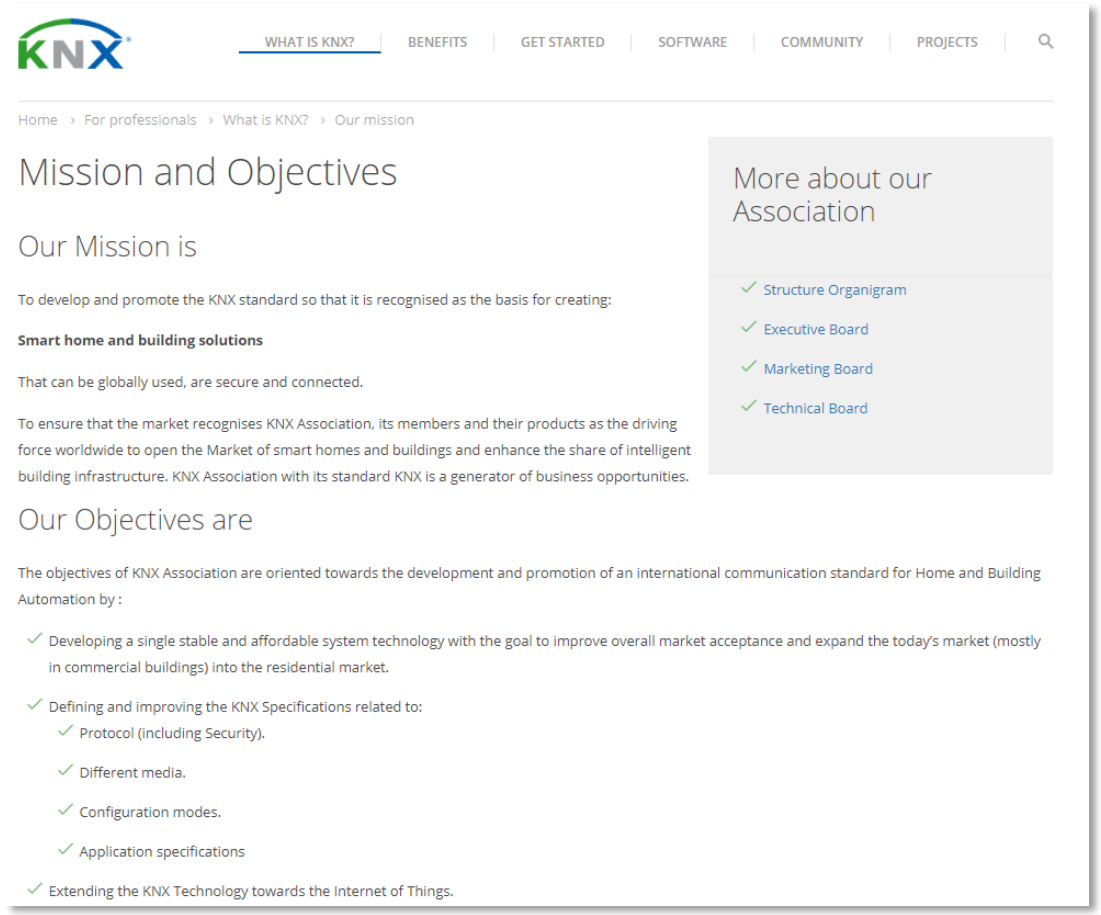
KNX Organisation



www.knx.org

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KNX Australia Organisation

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

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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!

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KNX Philosophy

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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.**

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Over 8,000 products available

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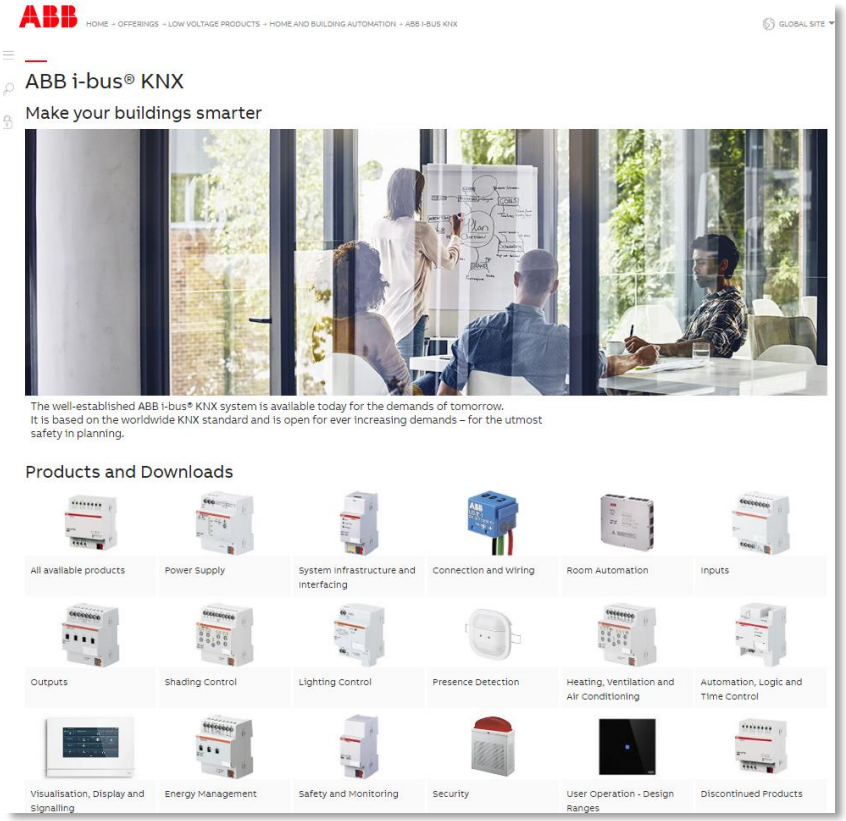
ABB i-bus KNX – The future of Building Control at www.abb.com/KNX



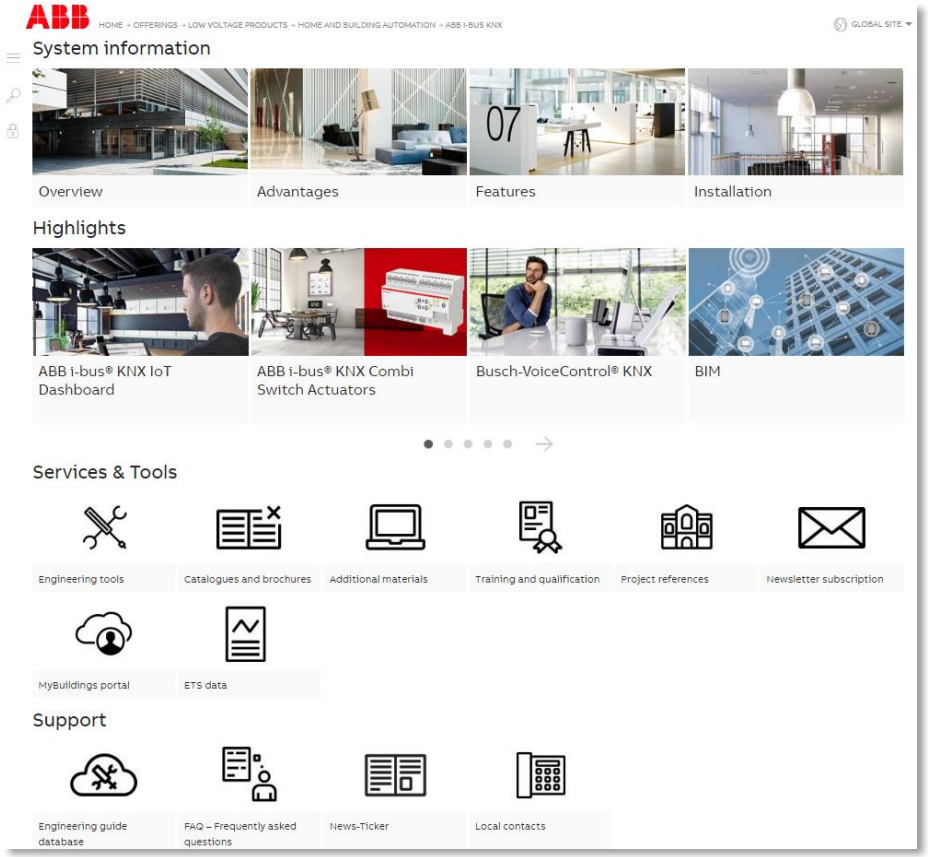


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ABB i-bus KNX – The future of Building Control Product overview

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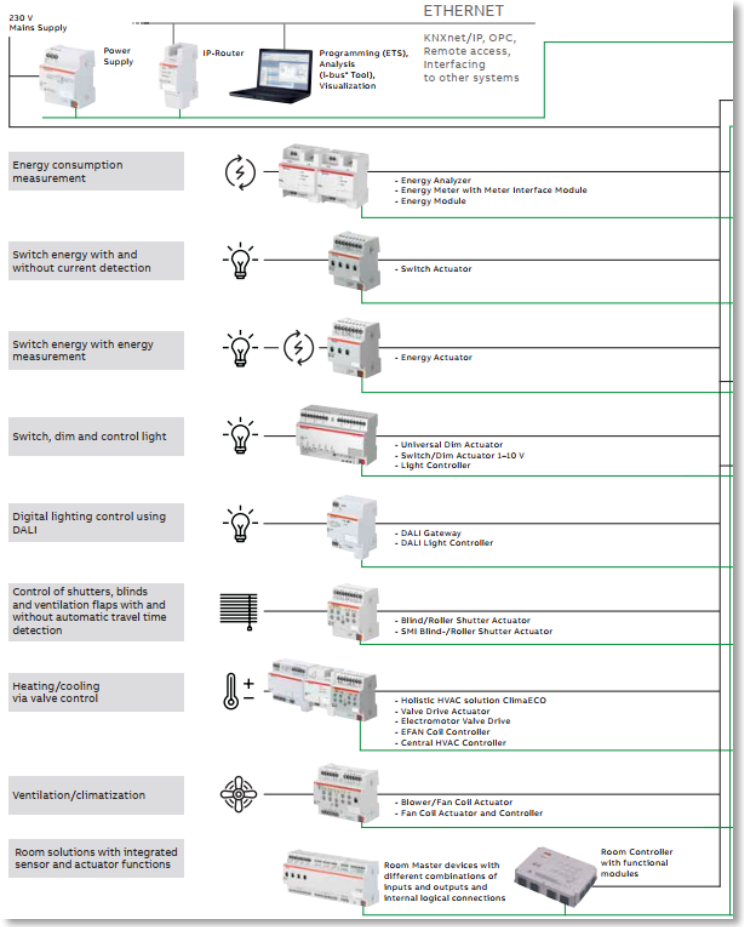
ABB i-bus KNX – The future of Building Control



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

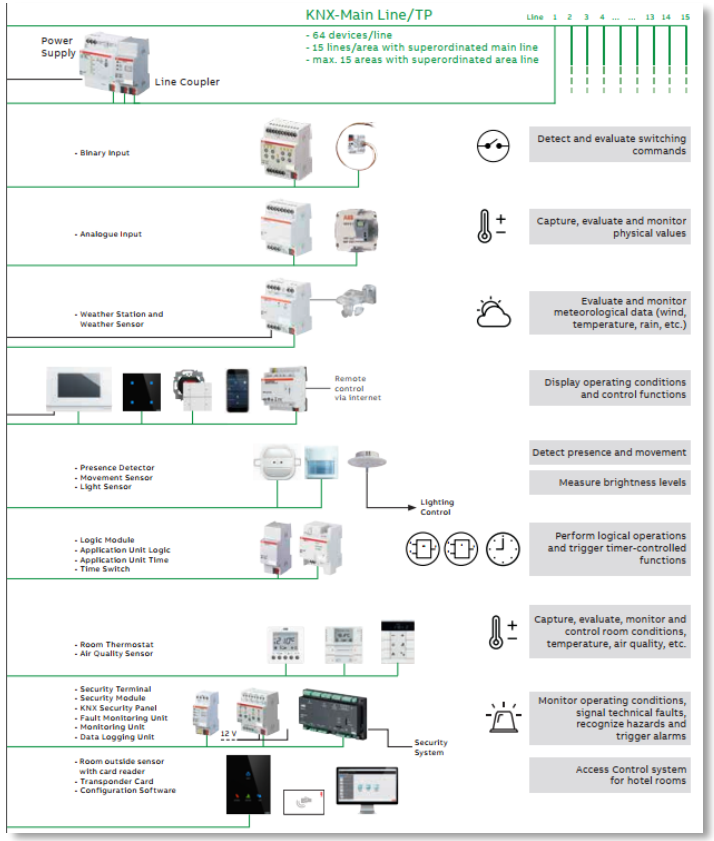

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ABB i-bus KNX – The future of Building Control

- 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

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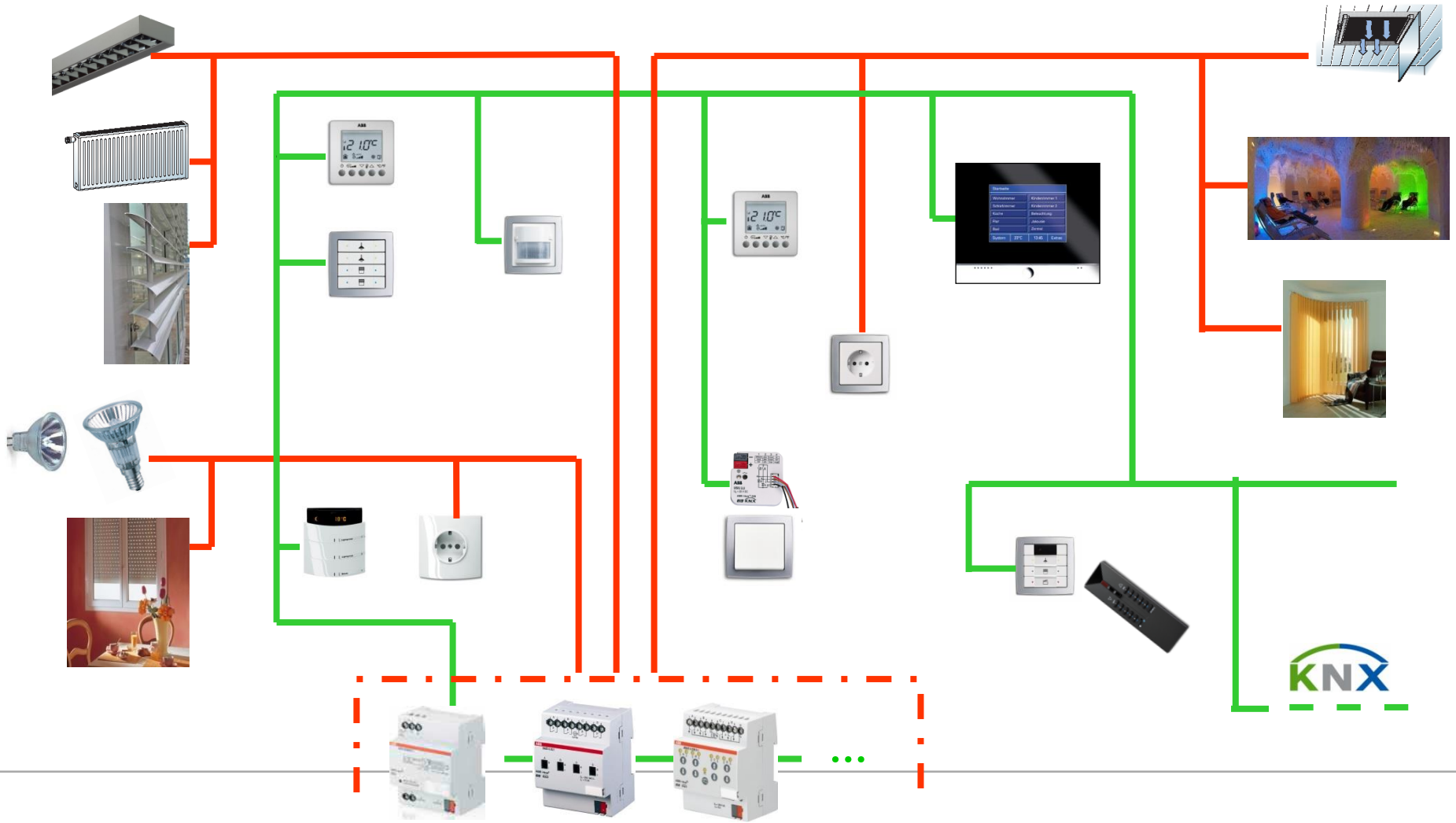
ABB i-bus KNX – The future of Building Control



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KNX Interoperability

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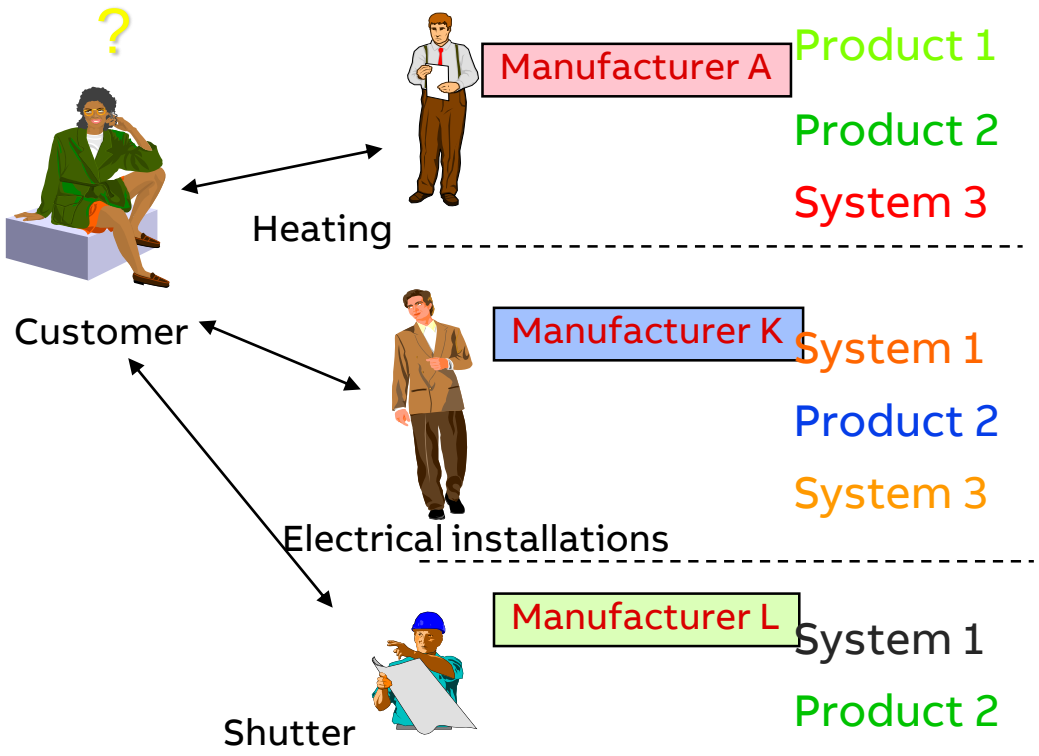
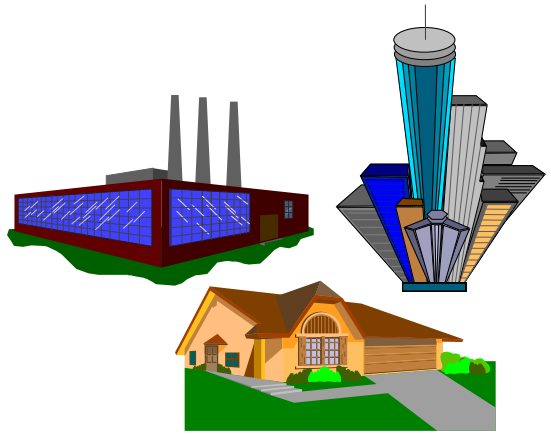
KNX Interoperability

Conventional Installations





Linking several functions

expensive

cost-intensive

inconveniently arranged

complex

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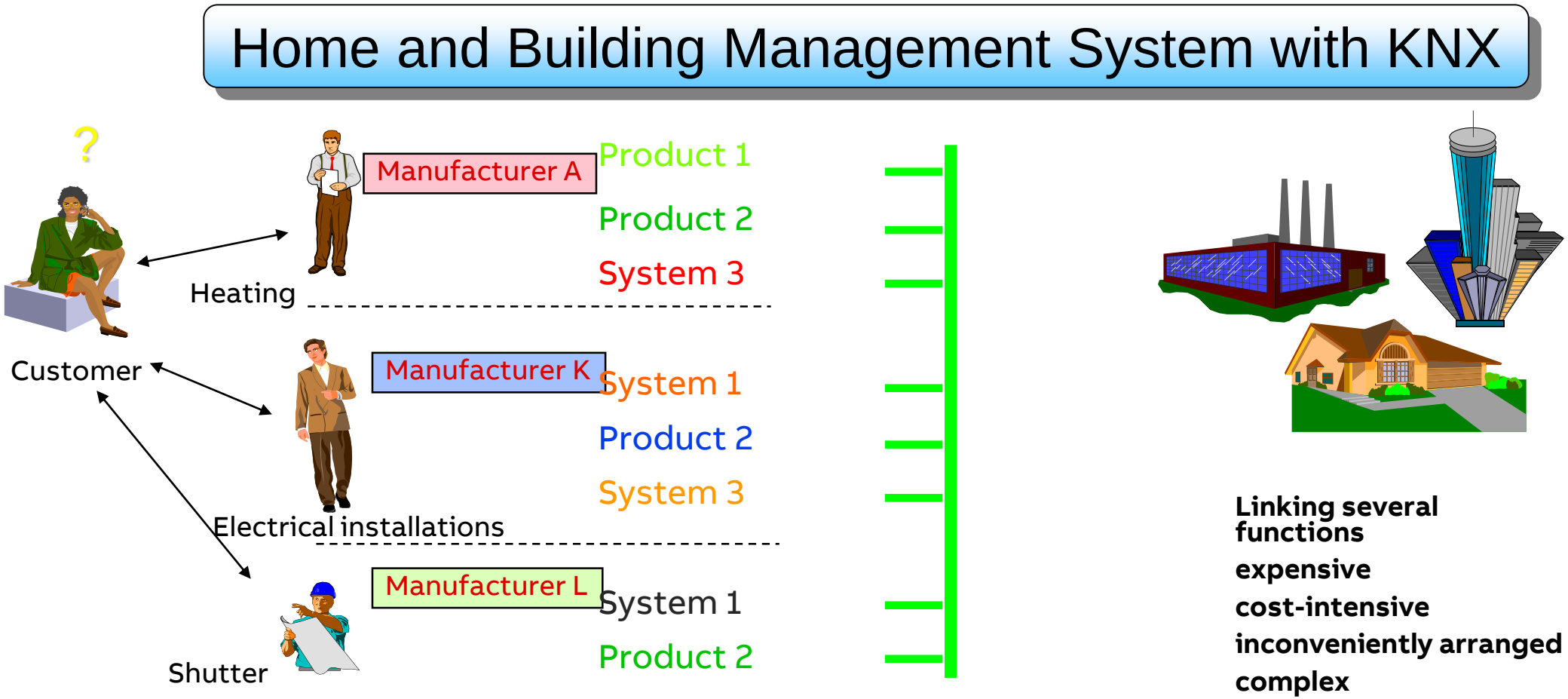
KNX Interoperability



Linking several functions

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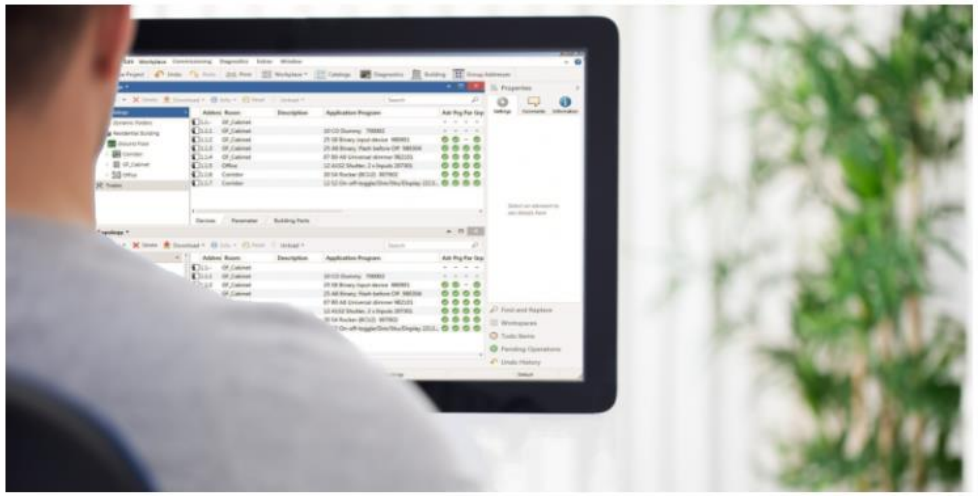
KNX Interoperability with ETS

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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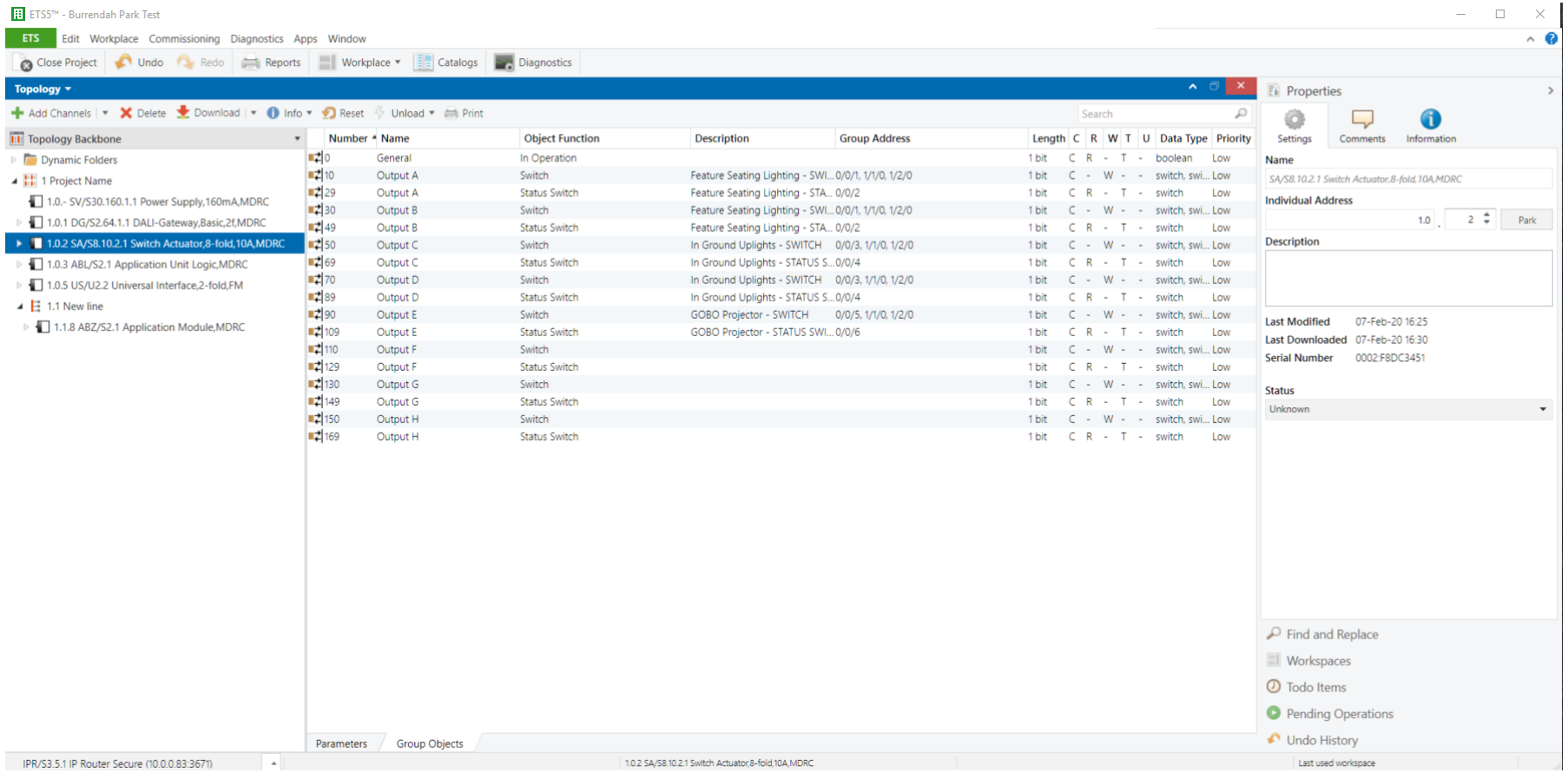
KNX Interoperability with ETS



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KNX Application Areas

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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!**

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Application Areas – Lighting Control

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

Triton 5-fold

Dim Actuator

Motion Detector

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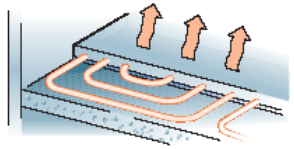
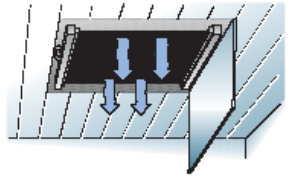
Application Areas – HVAC Control

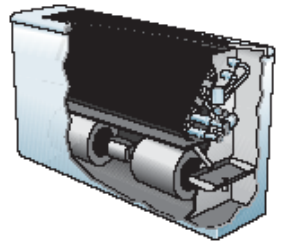
Individual room control – time and remote controlled

Room Thermostat

Electrothermal or Electromotorical Valve







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Application Areas – Shutter and Blind Control

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

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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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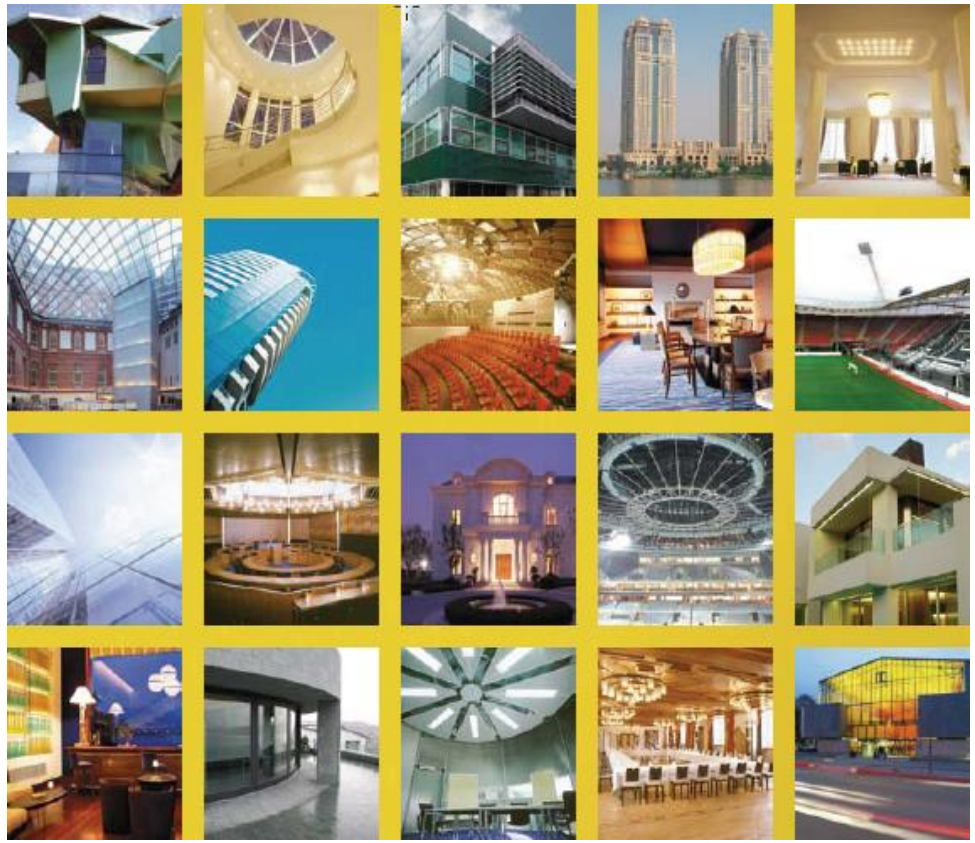
Building Types



- Office Buildings
- Apartments/Villas/Flats
- Hotels/Restaurants/Hospitals
- Exhibition Centers
- Sport stadiums
- Museums / Churches
- Schools / Universities
- Banks
- Airports
- Industrial Facilities
- Shopping centers

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KNX Energy Efficiency

Yes, we care!

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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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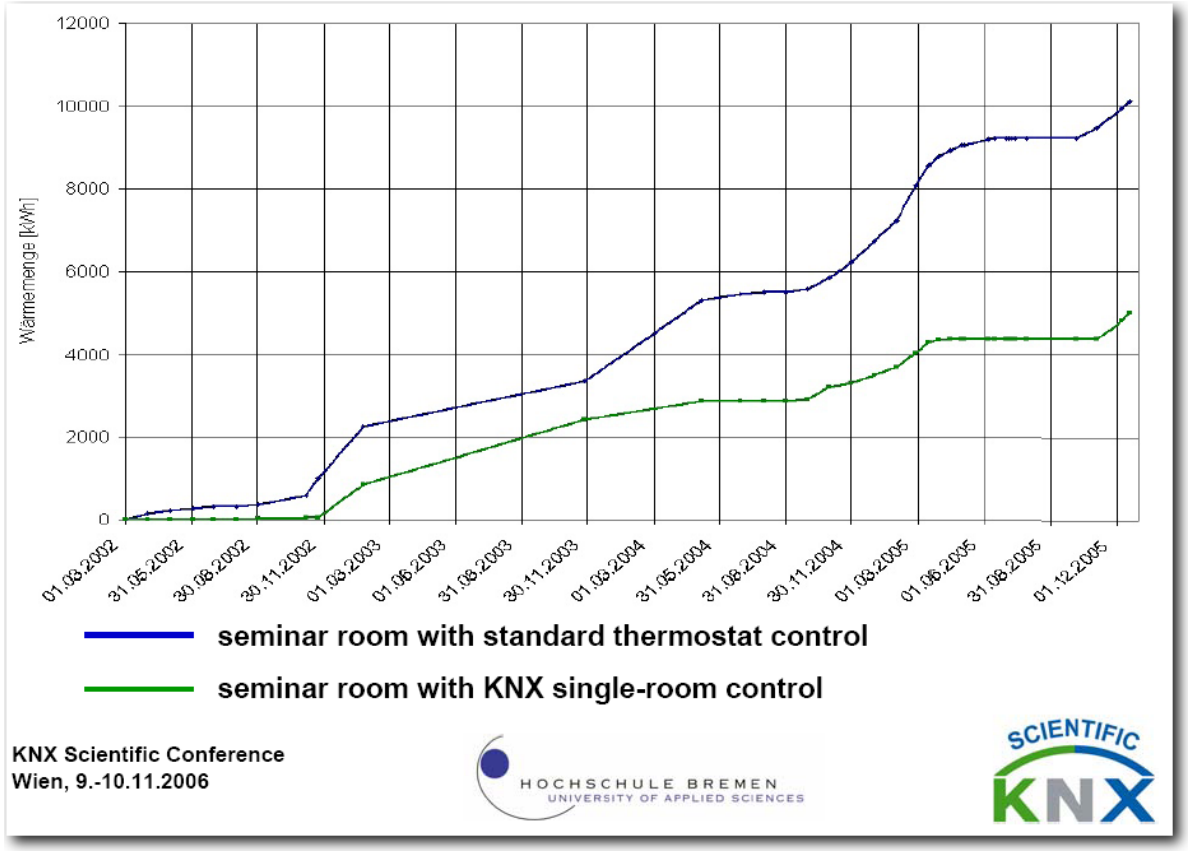
Energy savings – University of Bremen

Heating energy usage



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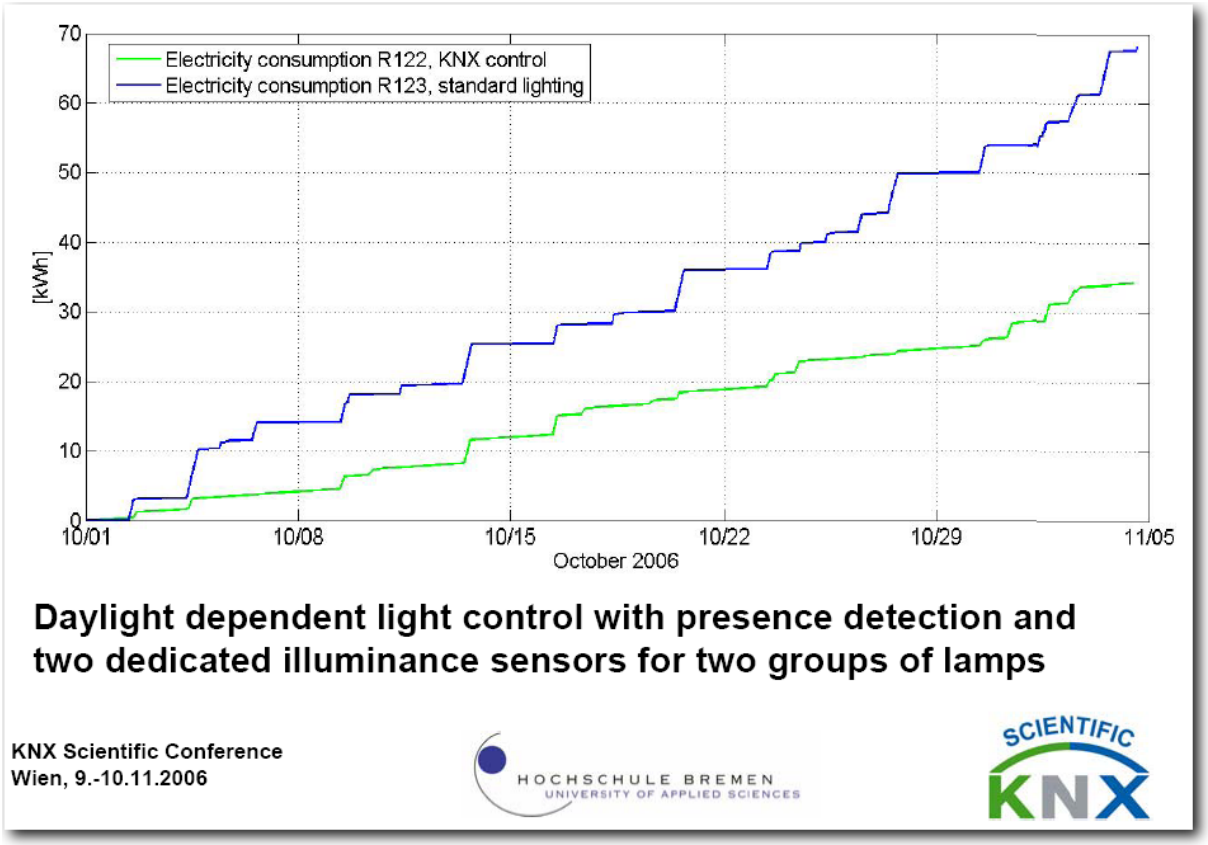
Energy savings – University of Bremen

Lighting energy usage



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KNX Projects

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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

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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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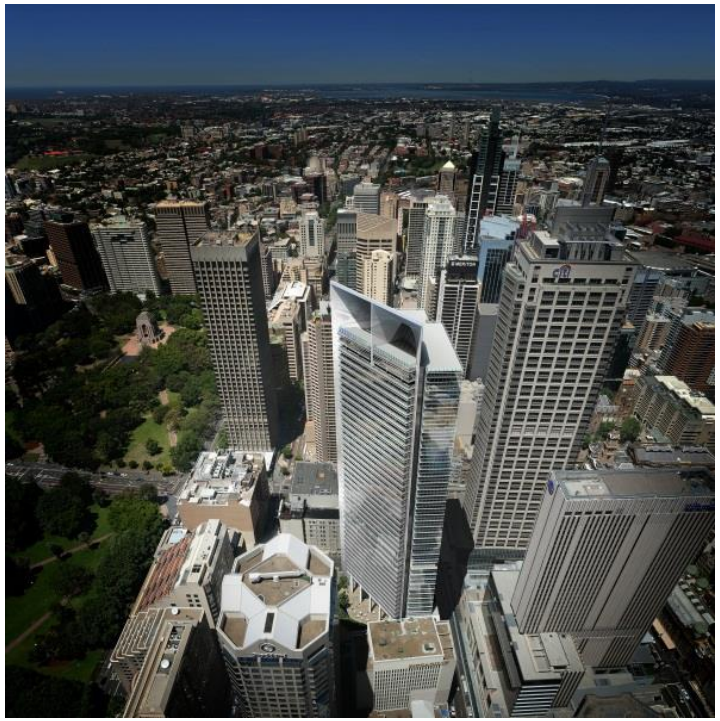
ANZ Tower Sydney



- 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

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