
SMART BUILDING

ABB i-bus[®] KNX

Intelligent building
systems technology





SMART BUILDING

Why is it safest to plan with ABB? No one can foresee the future. One thing, however, is certain: more and more is expected of building systems technology. The well-established ABB i-bus[®] KNX is today available 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.



Simple and uncomplicated planning

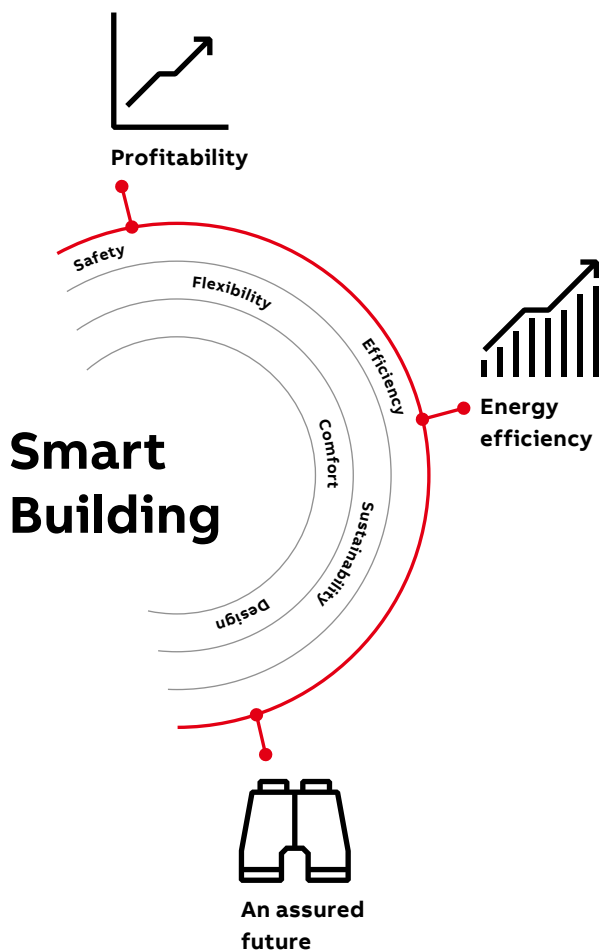
Meeting requirements easily

Smart Buildings for increased productivity. Building Space® from ABB, the complete intelligent building automation for increased efficiency in all rooms.

All who work in Smart Buildings benefit from the new environment: intelligence leads to an increase in production. And here ABB offers decades of experience and know-how – a comprehensive offer for control and automation with individual components and entire systems. A genuine plan for the future.

Building Space® set-up

Today buildings used for commercial and industrial purposes must meet increasing demands: new regulations and international standards change the basic conditions. Owners and operators must optimise energy consumption and reduce operating and maintenance costs, so that lessees profit from increased comfort, safety and reduced operating costs. And here intelligent building control makes the decisive contribution.



The advantages for the suppliers

- Reliable planning
- Economic installation
- Fast integration
- Easy to start up
- Flexible extension

The advantages for the customers

- Comfortable to operate
- Use of extensive functions
- Fast modification and extension
- Saving of energy
- Safe investment for the future



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Each building is ready
for the future, with the
intelligent control of
light, shading, room
climate and safety.



ABB i-bus® KNX uses the internationally established KNX standard. It is not by chance that ABB plays a leading role in the KNX Association. The fully developed top technology can be used universally and integrates itself perfectly into all current architectural and utilisation concepts. Thinking ahead globally is typical for 135,000 ABB employees in more than 100 countries – intelligent networking for intelligent building systems technology.

KNX with ABB

A single-source supplier

A partnership for planning safety. The requirements for the feed-in, the distribution and application of energy are as varied as they are unique. Functionally combining everything requires faultless planning.



Here, a full-service provider offers a lot more. At ABB, everything is structured sequentially for greater convenience, efficiency, safety and sustainability, and, in addition, for the flexibility to modify something at all times.

Filling rooms with energy

Wherever people work together globally, there is an increase in the demands for comfort and the performance of buildings, as well as the improvement of energy efficiency. ABB combines all this with KNX. This, for example, enables intelligent presence detectors to efficiently utilise lighting energy, as well as ensure pleasant illumination. Other sensors and actuators improve the quality of air in a room. This allows the planner to offer his customers the best solution.



Why are KNX and ABB an ideal connection? The KNX standard has asserted itself – with all its new possibilities, and without the technology becoming more complicated. On the contrary, at ABB it is even structured more simply. With ABB i-bus® KNX, planning, set-up and operation become more transparent and efficient. No matter what demands are made on building automation in the future, this can be planned with KNX.

Technology with a future

KNX as global standard

Automation creates independence. KNX is the consistent development which meets the needs of all users: comprehensive room functions are easy to operate and efficiently automated, the entire variety of options is attained with the uniform bus system. This makes it even easier for planners, electrical installers and system integrators – the standard as the principle for the future.



Offering variety – reducing costs

Each planner can reach the required targets. Even new standards, ordinances and laws are a good reason for offering something new. This makes energy efficiency the most important issue for all buildings. No less important are the increasing demands of the customer, which simultaneously increases the pressure on expenditure. With ABB i-bus® KNX the trades grow together, everything becomes so efficient that even prices can be calculated at a reduced rate.

Recognising trends – fulfilling wishes

Acting instead of reacting – the current developments can be used by everyone. The trend towards automation now leads to individual room functions being combined. Here the conventional cabling technique is inadequate. ABB i-bus® KNX is ideal for these new requirements. This is especially important since it allows technology for future trends of the Smart Building to be easily retrofitted.

Perfectly planned

The advantages at a glance



Energy efficiency

The intelligent, networked control reduces the consumption of energy during perfect function – ideal for light, shading, heating, ventilation and air conditioning.



Comfort

The technology shapes the environment according to personal wishes. Today only a few movements of the finger are required to adjust all the factors for one's well-being.



Economic efficiency

Good figures have reasons: energy-saving automation, intelligent control, individual adaptation, and control and planning with a clear overview.



Reliability

The system is stable because one has a clear overview of all values and can respond immediately when necessary. Monitoring and maintenance are noticeably simplified.



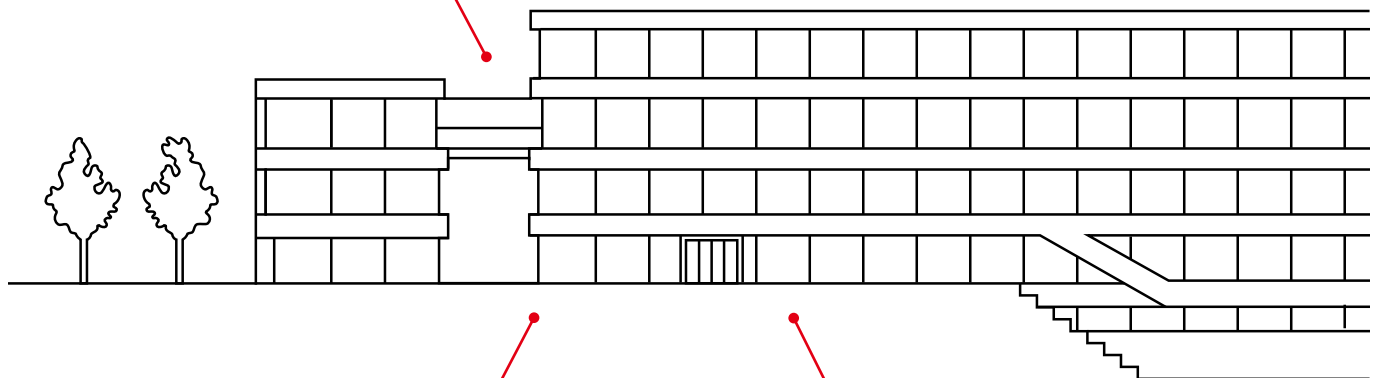
Flexibility

The functions of a building change over the course of decades. The bus system always remains flexible: everything that is necessary can be extended and reprogrammed at all times.



Safety

A lot can happen in a building. ABB i-bus® does everything to protect the people in it to be rescued during an emergency, and retain the value of the property.



Improving economic efficiency

ABB i-bus® KNX influences many ecological factors. It is easy to save energy with intelligent control. Whether it is with the control of individual rooms with regard to heating, ventilation and air conditioning, with the illumination according to requirement, or with the control of blinds for the utilisation of daylight and sunlight. Additionally, the facility management optimises the consumption of energy by comprehensively recording operating data, which can be clearly visualised.

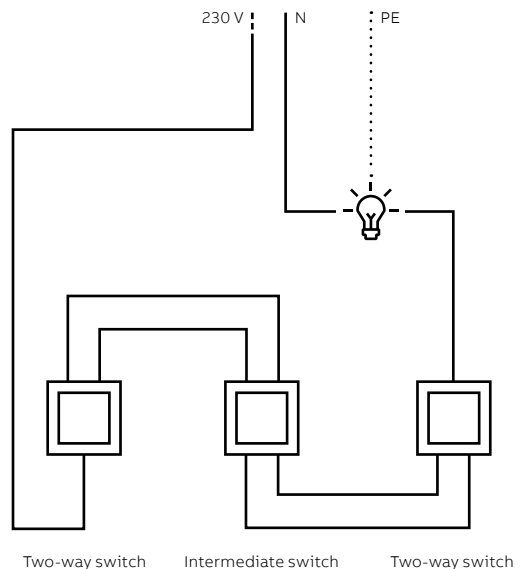
Increasing energy efficiency

Technology can do much for the protection of the climate: intelligent building systems technology utilises the entire potential for optimisation, especially with regard to energy-intensive illumination and shading as well as for heating and ventilation. Here ABB i-bus® KNX systems connect economic consumption control with the actual demands on comfort. This immediately increases the attractiveness of private and functional buildings.

Intelligent building control

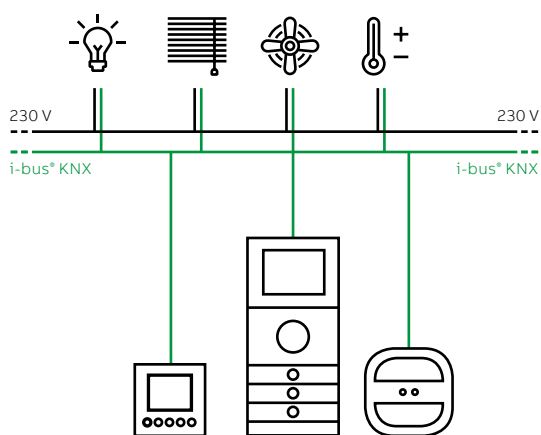
KNX compared to conventional solutions

As versatile as it is easy, KNX sets the new standard. It is the only way to meet the new demands made on electrical building installation. The intelligent building systems technology takes over the conventional functions – and it perfects them thanks to ABB i-bus® KNX. This creates a performance spectrum for building control. Consistently complete.



The conventional solution

The room functions are carried out separately in conventional technology. To create connections would be too complex and not really target-oriented: the installation expenditure would be too high and the functionality only partly networkable. The current installation is as it is and remains so: sound yet flexible.



Everything under control

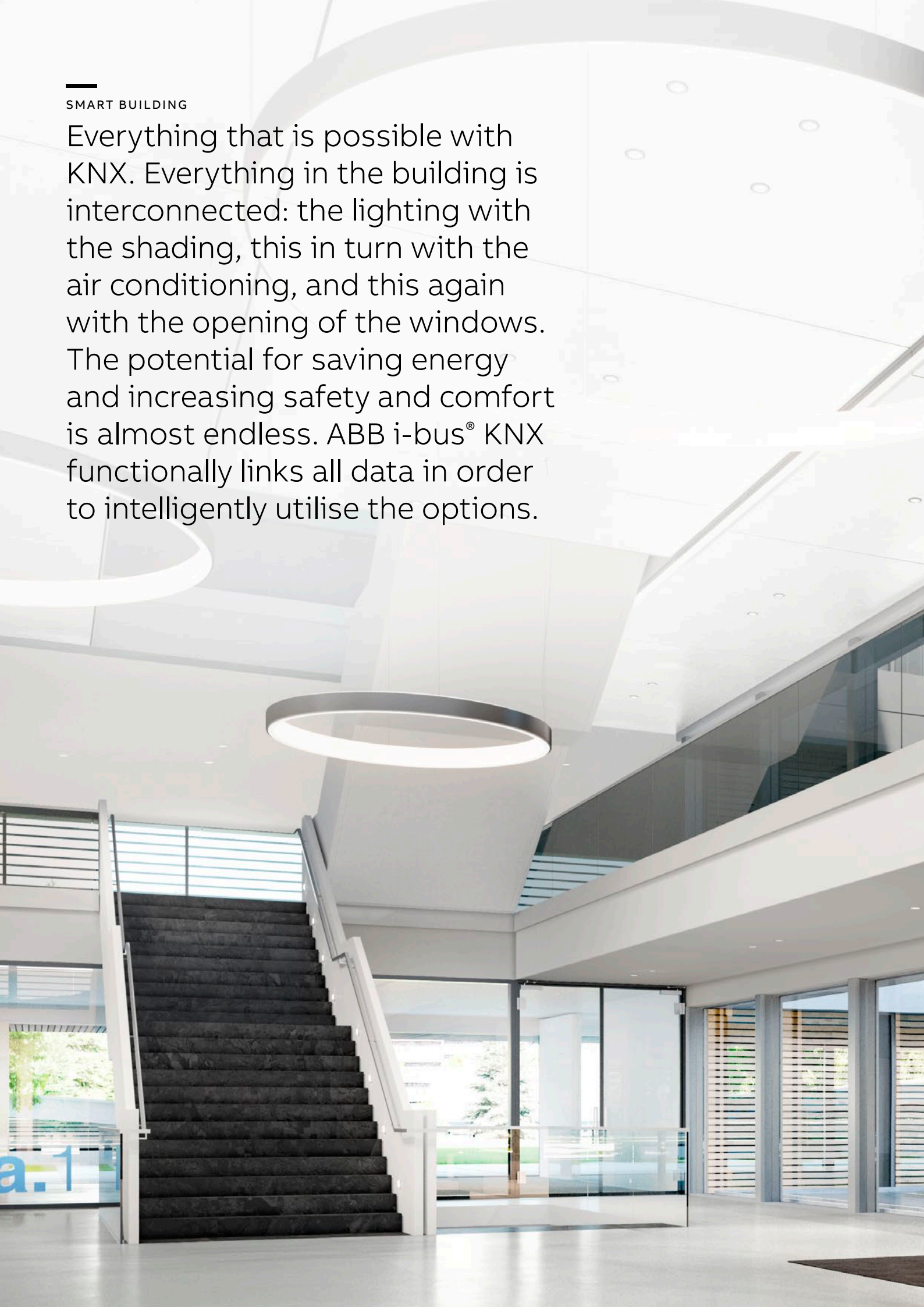
Lights, scenes, blinds, heating, timer, and more can be controlled completely intuitively with the central rotary control element and a clearly structured TFT display. The functions can be freely allocated to the rockers. The Busch-priOn® range comes in high-quality design versions – glass or stainless steel harmonise in both form and function.

KNX as the intelligent solution

The bus lines are independent from the power lines. This combines all command generators and receivers in great diversity. All conceivable trade-spanning functions are possible. Future applications can be added at any time. Flexibility is the standard.

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Everything that is possible with KNX. Everything in the building is interconnected: the lighting with the shading, this in turn with the air conditioning, and this again with the opening of the windows. The potential for saving energy and increasing safety and comfort is almost endless. ABB i-bus® KNX functionally links all data in order to intelligently utilise the options.



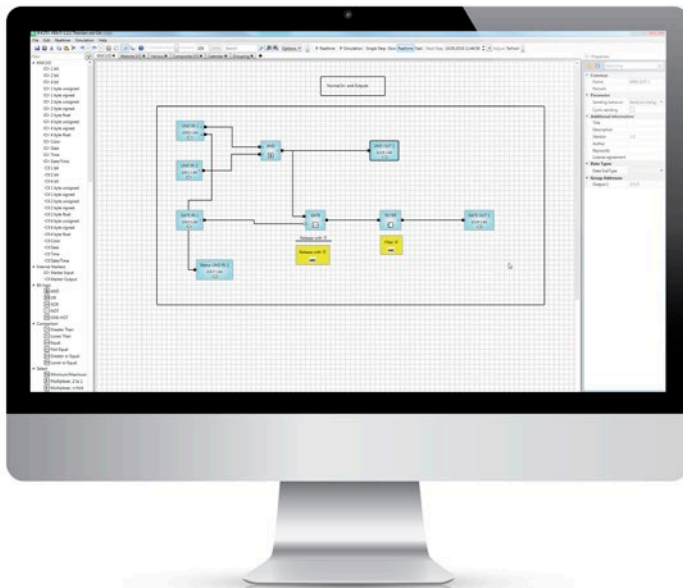
BUILDING SPACE® | OFFICE



Planning and project

Greater flexibility at all times

Changing technology. ABB i-bus® KNX means total freedom in planning. The KNX standard even allows the products to be selected independent of the manufacturer. The functions from the different trades are linked together. Changes and extensions are possible during the project – without new planning, without new cables. Existing systems can also be adapted after many years. Complex gets simple.



The manufacturer-independent software tool ETS (Engineering Tool Software) is used for the practical planning, commissioning and maintenance of KNX installations. With user-friendly drag and drop, the electrical specialist can select products from a database, set the parameters and link sensors and actuators. After successfully commissioning a KNX installation, the tool can also be used to create the product documentation. A comprehensive training tutorial is available for all steps. No question remains unanswered.

1. Planning

The requirements of the investor or builder are implemented during system integration via the KNX devices and the product software. During planning, the builder's specified requirements flow into the design and are summarised in the description of the functions.

2. Project planning

The suitable components and software applications are selected and the planning of the bus topology is implemented. This results in the necessary system devices for the set-up of the KNX network. In this phase, the ETS-based project planning is carried out on the basis of the description of functions.

3. Commissioning

The devices are installed and programmed during commissioning. And the program, which has already been created, is loaded into the devices via the ETS software.

4. Operation and maintenance

The requirements specified in the description of the functions are used to test the programmed functions during handover. This determines and documents the correct functional method of the system. The client receives the project documentation after the handover.



Global perfection

ABB i-bus® KNX is used every day throughout the world by electrical planners, electrical installers and system integrators. The concept is so well thought out that the people in the buildings are unaware that it is operating, because all the components of the technology bring about a fully functioning unit from the first project step to running operation.



Flexible planning for:

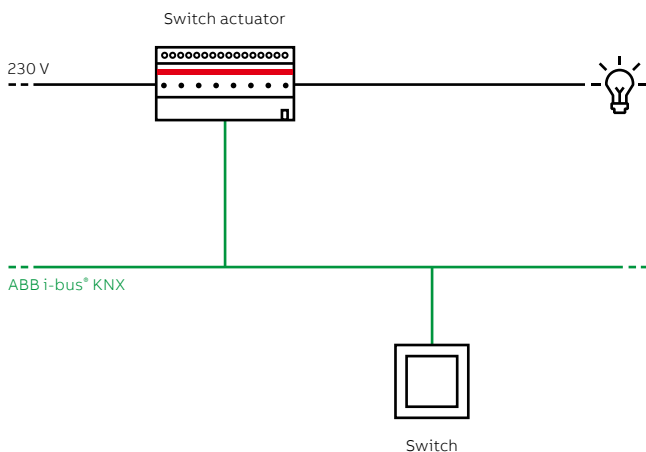
- Lighting
- Air conditioning
- Shading
- Safety
- Energy management
- Operation
- Automation
- Communication

Simple flexibility

Extremely versatile networking

Freedom of design due to technology. The analogue switching of currents is not modern technology for meeting increased demands. Bus systems perform remarkable things everywhere, whether in airport buildings, hotels or single residential units. Building automation here is no different. The data transmission separated from the current here offers numerous controls – nuanced and precise.

This is how bus technology functions



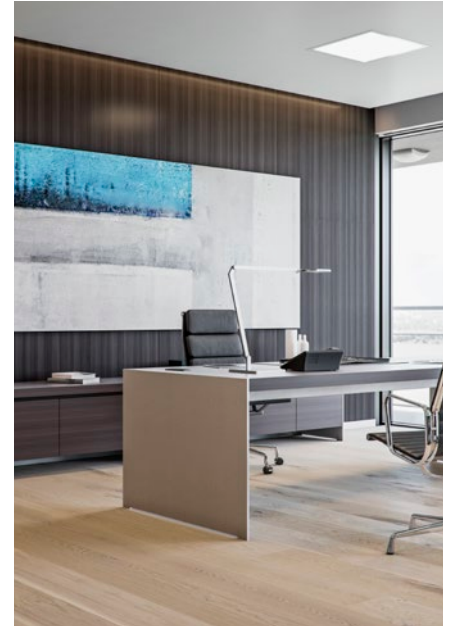
The ingeniously simple principle of bus technology is fundamentally based on the separation of energy and information. The switch for a lamp is activated via the data from the information line. Even complex systems can be mapped to this simple principle.

Well thought out

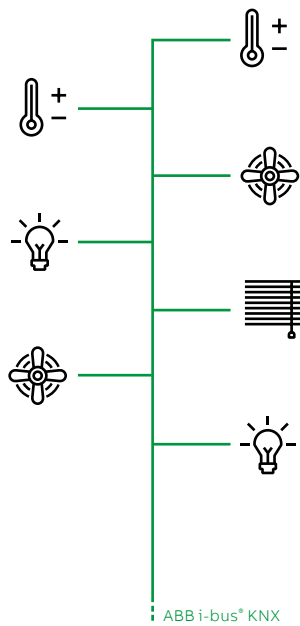
The separation of energy and information simplifies the circuit as a whole, since numerous controls in the building are combined. Networked intelligence is created from the multiple linkage of sensors and actuators, no different to the human nervous system.

Flexibly networked

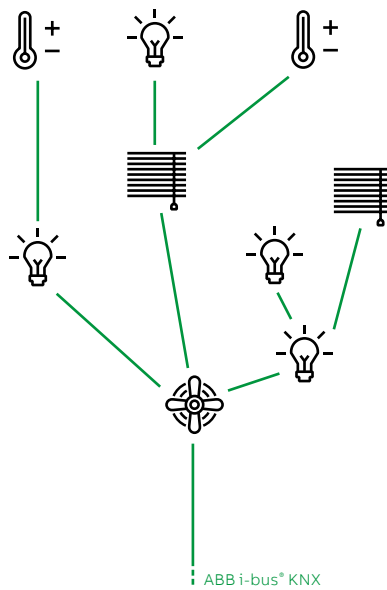
The three fundamentally different options of the structure – line cabling, tree cabling, star cabling – are based on the simple principle in which a sensor supplies information to the actuator via a current-independent data line. Each structure offers genuine transparency for operation and maintenance – with a glance at the screen. No more time-consuming errors.



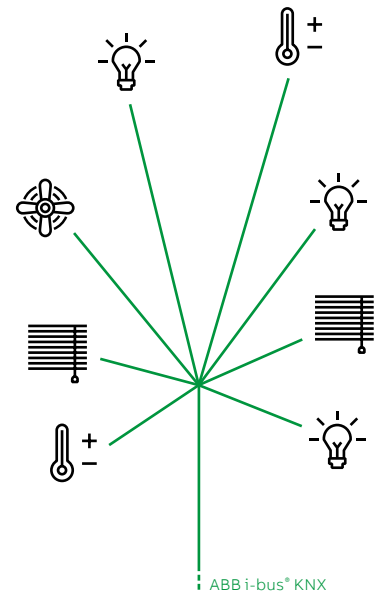
Line wiring



Tree wiring



Star wiring



The KNX structures

The three different options of linking all participants creates flexibility in the set-up: line, tree or star cabling adapts in an entirely functional way to the structural conditions and technical specifications. Every planning process becomes clearer and simpler than it has been up to now.

New clarity

The KNX mode of operation

Comprehensive, superior and clear. All trades are embedded in a single unit. KNX ends the adjoining position of different applications. ABB i-bus® KNX displays its strength in the mastery of many different sensors and actuators. Independent of how comprehensively the connections are extended.



Tailor-made communication

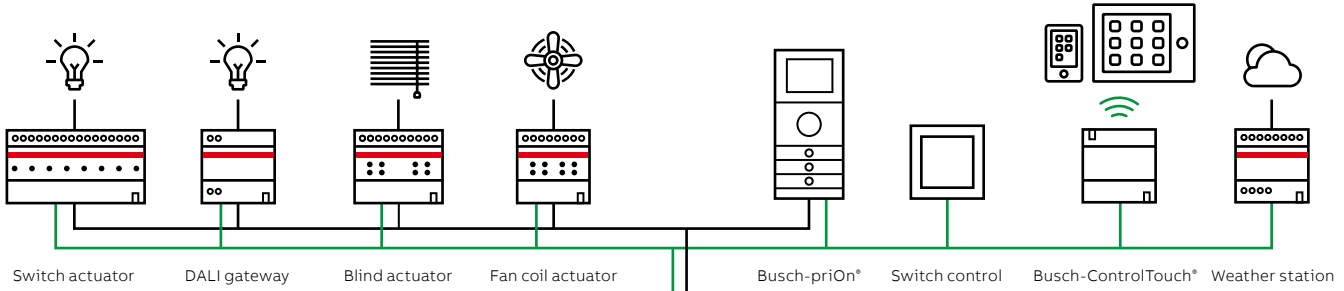
For a KNX bus system, all sensors, such as push-buttons or movement detectors, are connected with the actuators, e.g. dimming or blind actuators, via a data line. Different to conventional installation with the wiring of switches and loads. With KNX, all devices communicate via

data telegrams on the same bus line. The sensors send out commands, actuators 'hear' them and carry out a defined function as soon as they respond. Numerous functions can be parameterised with ABB i-Bus® KNX, such as group commands, logic sequences, and control and regulation tasks.

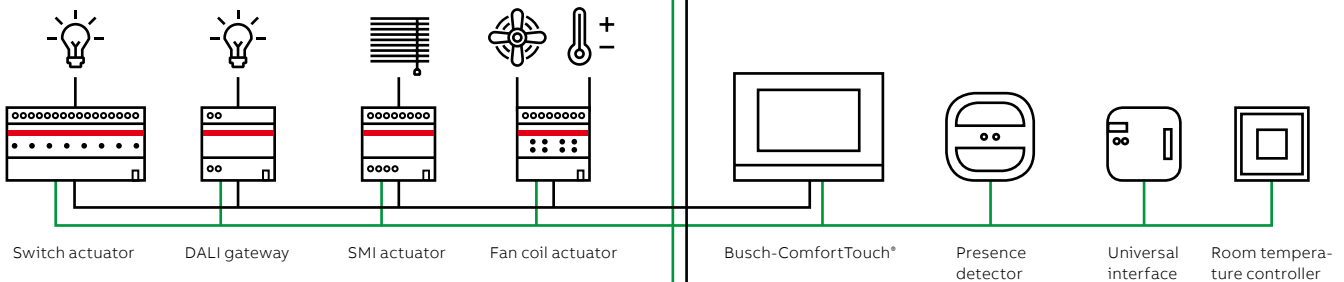
2nd floor

Actuators

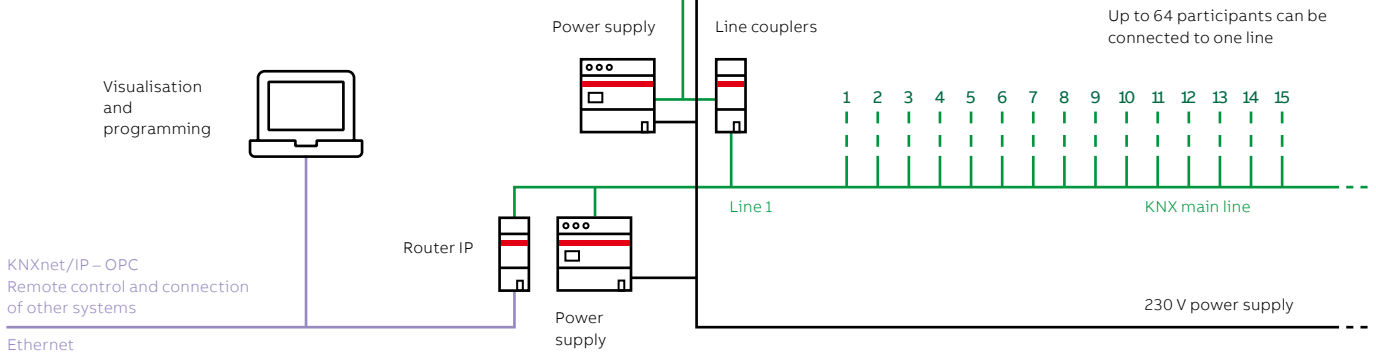
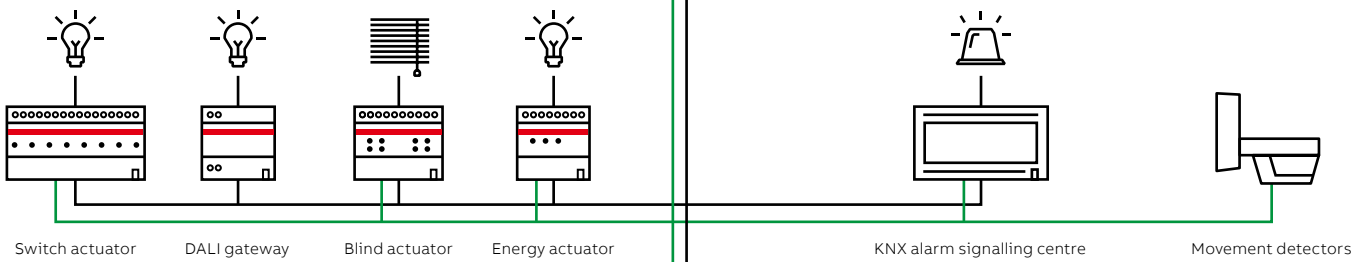
Sensors



1st floor



Ground floor



Reaching all targets

The KNX topology is divided into lines which, depending on the size of the network, are connected to each other via couplers. The participants in the respective line – the sensors and actuators – are supplied with energy via a 30V power supply, while the entire KNX bus system can consist of 50,000 bus subscribers.

Doubling performance

In addition to the 64 cable-bound components, 64 wireless components can also be coupled to the System Access Point – with flush-mounted devices, sensors and actuators for switching, dimming and for the control of blinds, with window contacts and with radio-controlled heater thermostats. All elements are compatible – simply ingenious.

Lighting control

Illuminating technology

Light in all its facets. The light in office buildings must fulfil a variety of tasks – increase energy savings, provide illumination adjusted to use, and increase productivity. ABB i-bus® KNX has the intelligent logic for all of this combined.



Automatic saving

The light adjusts itself to the use of the room – essential for saving energy. Sensors in the form of intelligent presence detectors gather a variety of data, which is sent to the actuators. The constant light control is convincing: the daylight is included, the illumination is where it is needed, the light slowly gets brighter as soon as someone enters the room and extinguishes as soon as the room is exited.

Smarter dimming

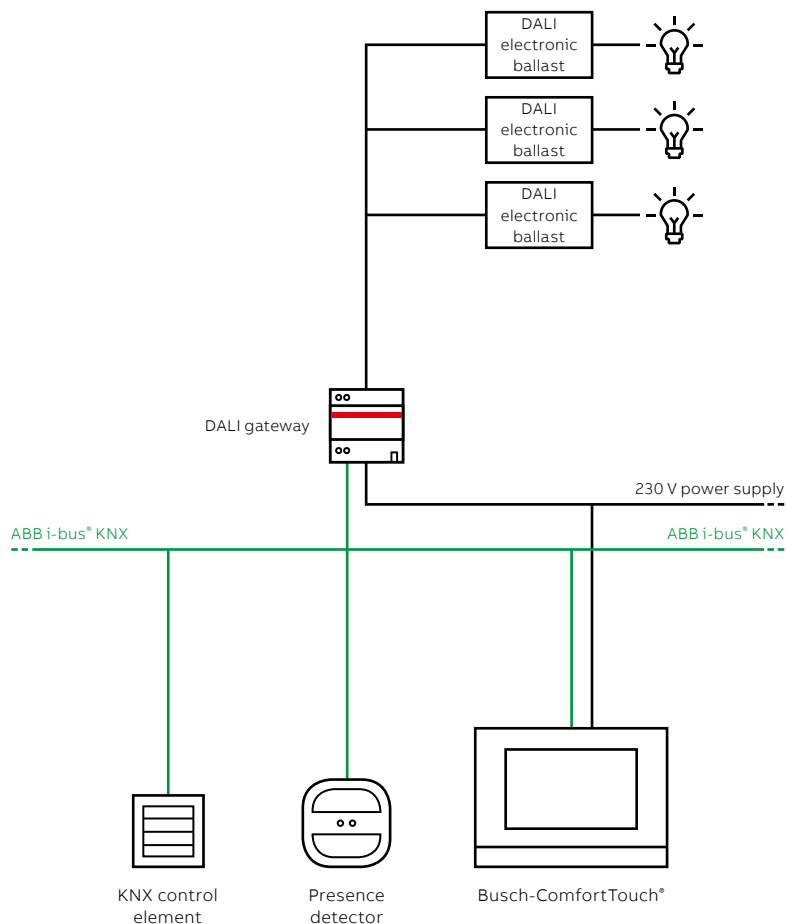
Control via the KNX bus is powerful, because it provides well-designed, comprehensive dimming. Numerous lights need to be controlled in large buildings, and this system allows them to be dimmed directly or in scenes according to their use. Depending on complexity and requirement, it is possible to integrate a 1–10 V or DALI control, or, if the colour of light is to be adjusted, an RGB control.

Types of control with KNX:

- 1–10 V control
- DALI control
- RGB control

Comprehensive light control:

- Switching
- Dimming
- Constant light control
- Automatic light
- Light scenes



Setting light into the scene

Light has numerous functions. Rooms can be optimally used with a clever scene out of blind and light. The RGB colour light control is a real eye-catcher. It lends rooms their individual charm. Everything functions simply for the user: at the press of a button.

Versatile control options

An intelligent building controls itself automatically and ensures an atmosphere of well-being, irrespective of the time of day. Precisely this is what the KNX bus makes possible. The intensity of the artificial light can be regulated depending on the incoming sunlight to guarantee optimum of every room: whether direct illumination at the work station in the office or a pleasant ambience at the coffee bar, all subtleties can be controlled.

Heating, air conditioning and ventilation

Ideal temperature

Comfort can be planned. With ABB i-bus® KNX, objective data can satisfy a subjective sense of indoor climate. All heating, cooling and ventilation sensors and associated actuators are viewed in their entirety. Intelligent and efficient control of the climate and excellent room air belong to the quality of the building.



Maximising energy efficiency

The smart combination of shading, heating and air conditioning system allows for the comfortable saving of a lot of energy. This means that when the setting of the slats is automatically adjusted to the position of the sun, the air conditioning system does not need to work as hard. The connection in the ABB i-bus® KNX is capable of utilising existing potential. A calculable advantage.

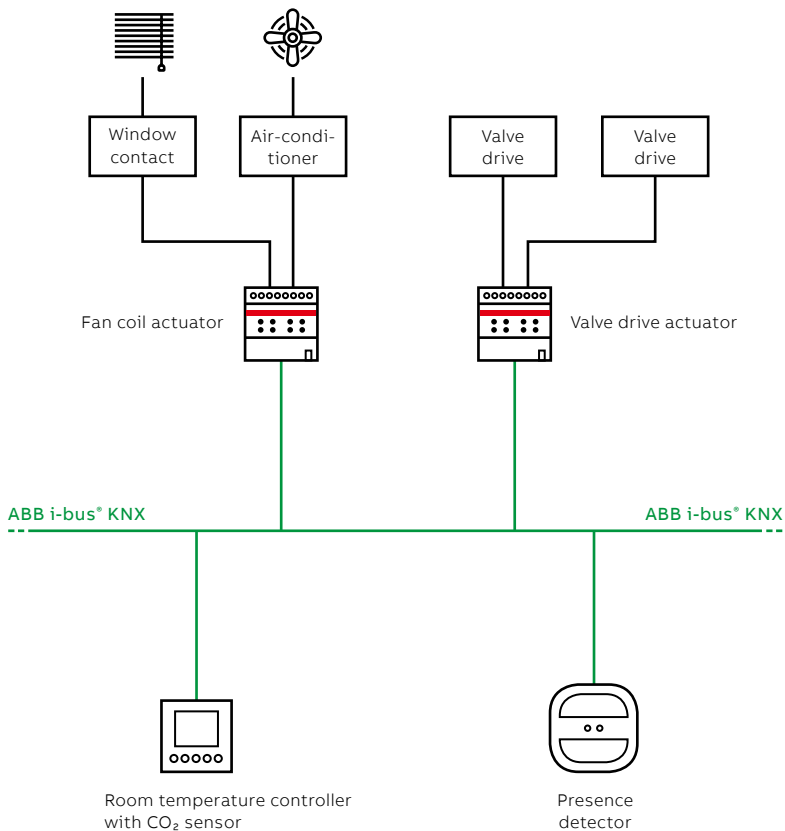


ABB i-bus[®] KNX attains:

- Individual room temperature control
- Efficient climate control
- Pleasant ventilation
- Fine fan-coil activation
- Safe window monitoring



Planning cost reduction

The energy costs of illumination and room air conditioning can be drastically reduced. They take up the largest share of the total energy consumption in the office building. With ABB i-bus[®] KNX, you can achieve double-digit percentage energy savings – a significantly high value for all practical applications.

Improving air quality

The room temperature is merely one aspect of achieving a pleasant room climate. It also depends on the number of persons present in the room. CO₂ sensors, fan-coil activation and window monitoring can ensure the best atmosphere in closed rooms at all times.

Roller blinds, windows and blinds

Sensitive sun protection

Intelligent control of light and shading. Technology adjusts the sunlight to the requirements. Sensors control the adjustment of the blind slats to the current position of the sun. Daylight is also included in the lighting scenes. And, finally, the air conditioning is influenced. ABB i-bus® KNX combines everything.

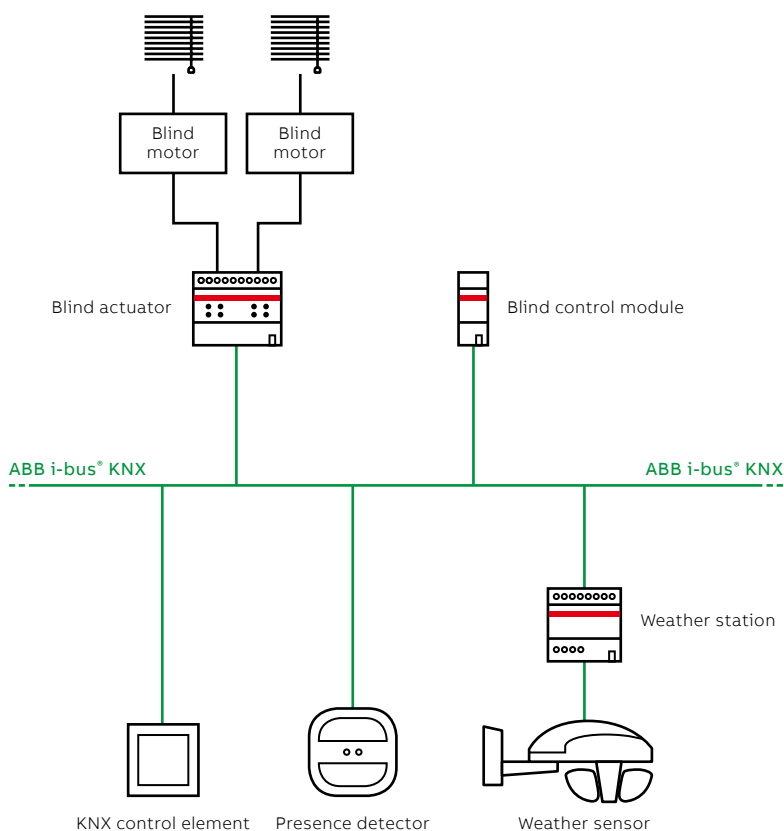


Controlling sunlight

There is real energy potential between the slats of the blind. You just have to take advantage of it. Because the slats can be precisely adjusted according to the position of the sun thanks to the sensor data. This is how optimum working conditions are created at the desks behind the windows and how energy is saved because the artificial light can be dimmed accordingly.

Capturing energy

The most economical heating energy comes directly from the sun. Especially in winter the sunny hours can be used by the automatic blind control. The blinds are moved up to warm the room with the energy from the sun; and in reverse, unnecessary heating can be prevented in summer with the aid of the blind.



Complete with ABB i-bus® KNX:

- Roller shutters and window control
- Blind control with repositioning of slats
- Automatic sun protection
- Curtain and roller blind activation
- SMI interfaces



Planning success factors

The sun is also an energy source for creativity at the workplace. The planner can also make an offer here, because ABB i-bus® KNX doses the sunlight in connection with the lighting control and the air conditioning, so that versatile light scenes fit precisely into the corporate culture. Efficiency due to new ideas.

Increasing safety

Consistent working conditions are essential for the value of an industrial or office building. Nothing should be disrupted or fail. This is how constant light control always creates the right conditions. If the blinds are moved up automatically during a storm, the other lighting factors simply adjust.

Building surveillance and personal protection

Comprehensive safety

Only a 100% solution applies to protective measures. Uniform system technology is the first choice. One which combines all sensors and actuators into a smooth solution, and one which perfectly automates alarm functions while at the same time providing a clear overview. KNX dispenses with island solutions and creates a safe network instead.



Completing components

The ABB safe&smart system includes suitable components in ABB quality and with tested compatibility for all alarm and KNX functions – a practical combination of security technology and building systems technology. This means that in case of an alarm, the blinds are automatically moved up and the lights activated in the entire building.

Networking functions

Safety thanks to KNX: operating devices at various locations allow full access to the system. This access makes it possible to trigger alarms, activate and deactivate the system, and activate various functions. One of these functions is the panic switch; here, in addition to the alarm functions, light and roller shutter drives can also be activated.

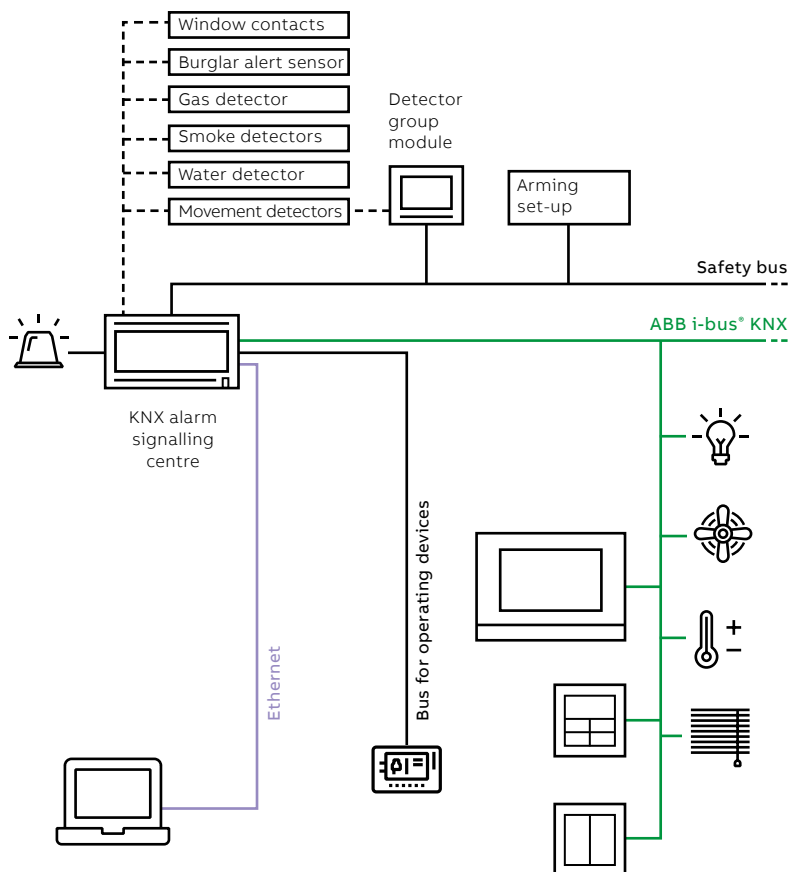


ABB i-bus® KNX links safety:

- Protection of persons and objects
- Door and window monitoring
- Fire and smoke detection
- Danger and burglary message
- Technical alarms
- Emergency signals
- Presence simulation



Overview of live status

The status of the system can already be seen during commissioning via tablet or web interface on the PC. The live status provides clarity. Errors, short-circuits or an overload of the system can then already be detected before installation is finished and rectified in time.

Speed-up of commissioning

The system can be set up and operated via a standard browser without any additional software. The current configuration of the alarm system is transmitted to the ETS via mouse click. The automatic scanning mode detects all system components that have already been connected to the bus. Nothing is overlooked.

Energy management

Precise measurement and control

Focus on operating costs. Progress should always be one step in the right direction. Today energy does not need to be wasted to generate an increase in economic growth. This makes it a central requirement for the ABB i-bus® KNX to reduce the operating costs for buildings and to use the necessary energy to suit the need and to save resources.

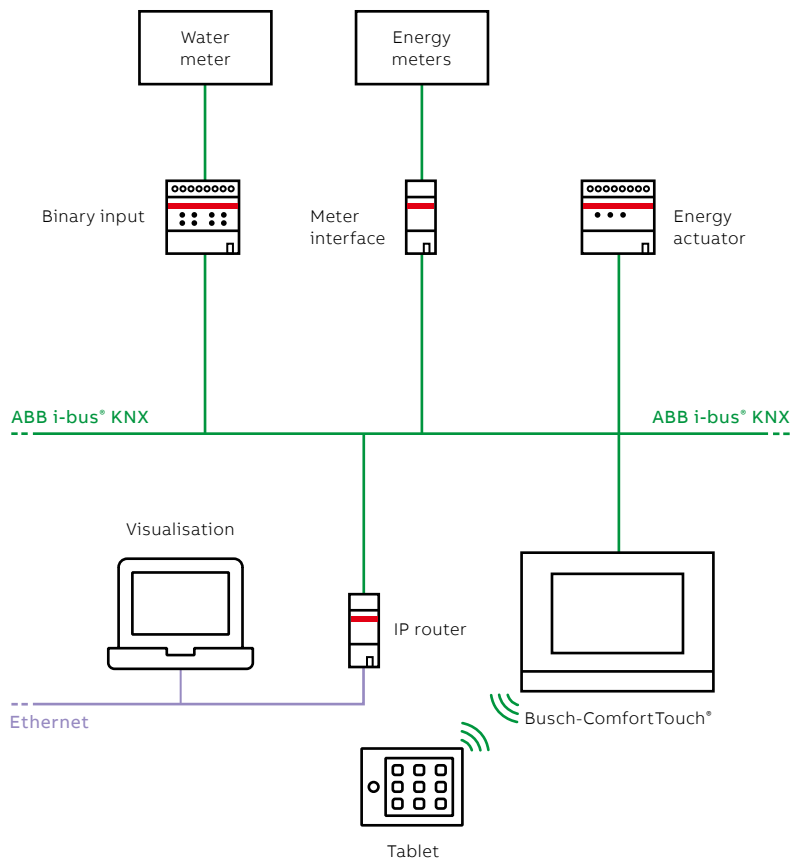


Analysing energy costs

Conventional power, water and gas meters are replaced with smart meters. Intelligent recording provides timely values on consumption and consumption periods, allowing appropriate action to be taken. A clearly structured display of this information appears on screens wherever it is needed. This allows the consumption to be conveniently checked and efficiently controlled.

Changing the behaviour of consumption

The analysis of the consumption behaviour is just as important as the up-to-date recording of the consumption. Today it is easy to discover how much energy is being used at which location and at what time. All this can be visualised on a tablet or on the Busch-ComfortTouch® on the wall.



Reducing operating costs with ABB i-bus[®] KNX:

- Recording of energy consumption
- Lighting according to requirement
- Presence detection
- Energy-saving air conditioning
- Monitoring of room temperature
- Activation of heating and ventilation valves



Saving with the energy actuator

Energy efficiency can be easily improved with the constant measurement of consumption and switching loads on and off according to threshold values. The ABB i-bus[®] KNX energy actuator SE/S 3.16.1 actively determines the energy consumption on three channels. It includes different variables via KNX and creates a functional consumption management.

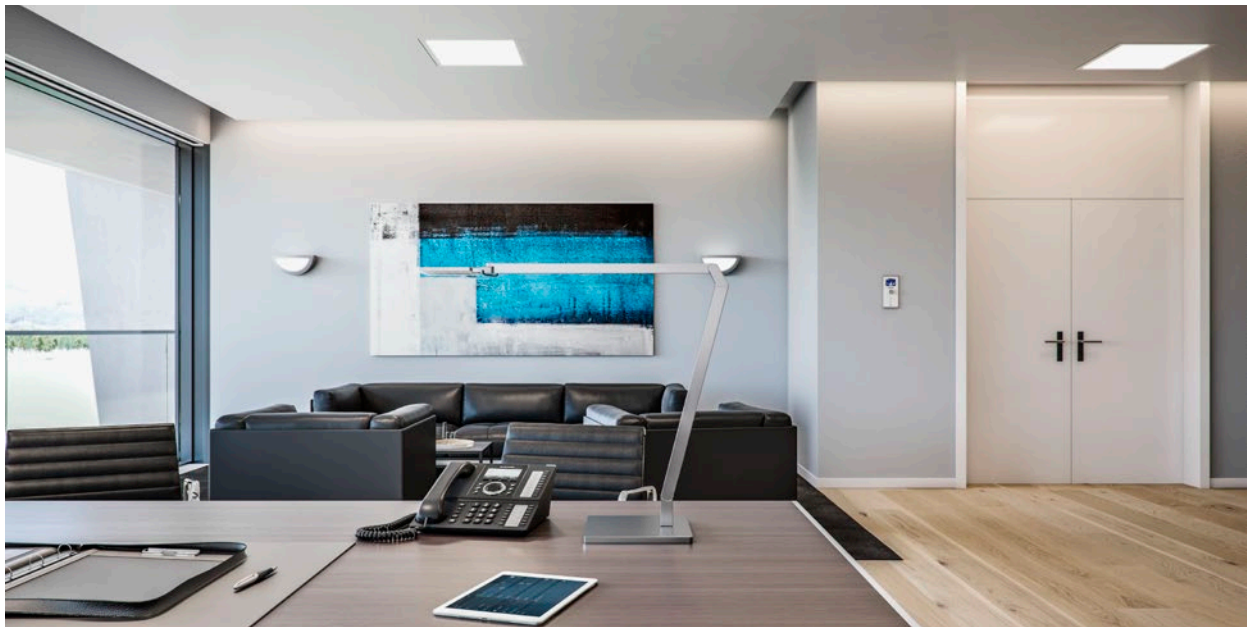
Saving energy intelligently

KNX is the standard for the future. Tomorrow's applications can be integrated into the existing network. This, for example, allows the consumption of energy to be optimised by means of an immediate, automatic deactivation of individual devices in the building. Centrally controlling the price and energy efficiency of electrical devices is no longer utopia, but will soon be completely normal.

Operation and control

Visible progress

Clear overview of all functions. Only when all control processes are clearly displayed at all locations is operation uncompromisingly comfortable and safe. This makes the wall switch a highly functional module today. In addition, a tablet or a smartphone with an intelligent app is even now an indispensable part of home automation.

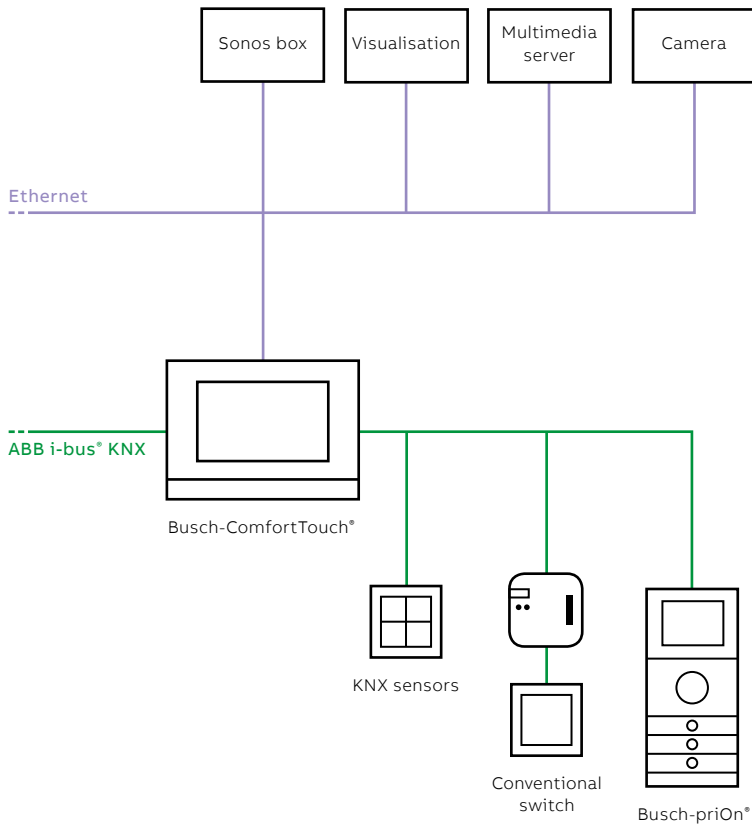


Beautiful functionality with Busch-priOn®

Today, the switch on the wall has new qualities. Busch-priOn® is impressive, on the one hand with its glass and stainless steel design, and on the other hand, technically: the rockers can be freely configured, the central rotary knob can be used as a KNX rotary dimmer or, in connection with a TFT display, as a universal control element. The modular set-up is as efficient as it is clear.

Huge diversity of operation

There is no 'either-or' but practical interaction. The classic buttons on the wall can be integrated via a universal interface and can be equipped with various functions. They complement each other perfectly with the new operating element, the smartphone: everything of importance is controlled on the Busch-ComfortTouch App with just a movement of the finger.



Clear overview due to direct connection

Large buildings need well-arranged displays in many locations for control – such as the Busch-ComfortTouch® – and via KNX they are easily connected. Their programming and visualisation is linked independently to the Internet via an IP router.

ABB i-bus® KNX makes it easy:

- Show
- Visualise
- Operate
- Message
- Inform



Freedom with the Busch-ComfortTouch App

Now building control becomes totally independent of the room – it can even be made possible via the Internet. The Busch-ComfortTouch App turns your smartphone or tablet into a mobile remote control for the entire home automation, whether lights, blinds, heating, air conditioning or safety. Technology for real estate becomes mobile.

Networking and communication

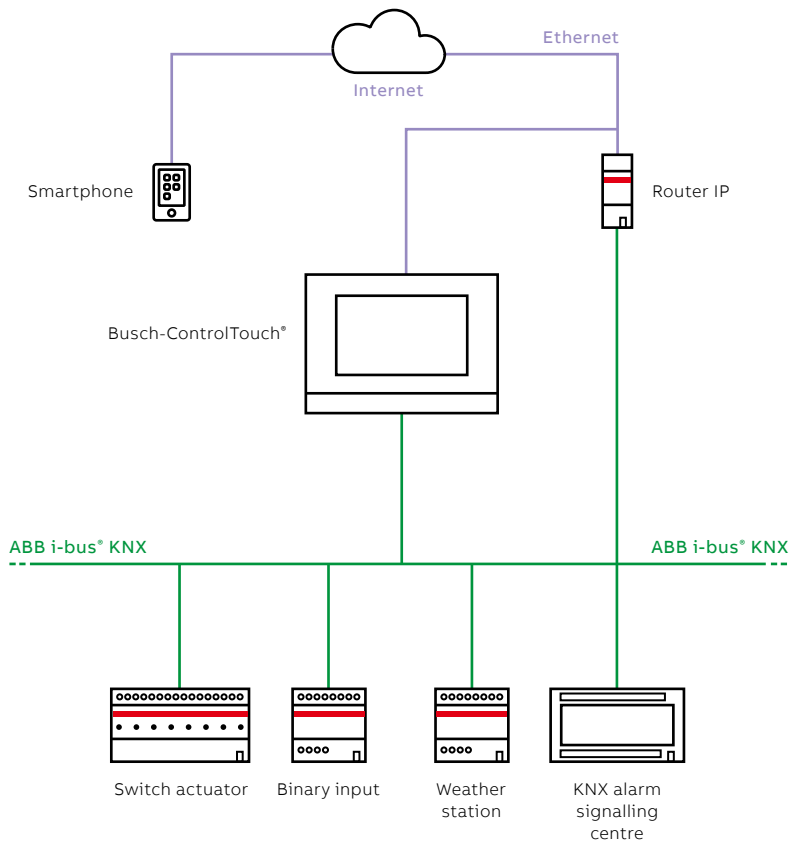
Perfect connection

The building becomes freedom. When compared to previous building technology, in which all functions were analogue-switched in current-carrying cable connections, ABB i-bus® KNX is something totally different. The functions of the house can be controlled from anywhere in the world. Yet this is far more than just controlling the functions: this is communicating with the building.



Deepening communication

ABB i-bus® KNX makes the interface available to the higher/lower level systems, which means that each user can also carry out the entire control via the Internet. IP gateways and routers create a universal connection via the Internet to outside mobile devices. The advantage for the electrical installer is that remote maintenance is possible to its fullest extent.



Network extension

The KNX bus, the Ethernet and W-LAN together become a practical unit. The logic of the interconnection is simplicity itself. The result is that the user can use their smartphone as the control.

The ideal network standard:

- IP connection
- Connection via telephone gateways
- Control via remote desktops
- Infrared remote control
- Execution of scene functions
- Audio/video functions
- Interfaces to OPC server



Use of independence

The Busch-ComfortTouch App provides totally independent control of all important functions. For example, it is possible to switch and dim the lights without having to get up, simply by using a tablet or smartphone. The same applies to door communication, heating control and more. The classic control elements on the wall are still as important as ever – however, it is the app which gives home automation its freedom of movement.



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Diversity is the new standard. ABB i-bus® KNX creates a structure for all desired functions. ABB products are fully developed for this purpose and highly efficient. The flexible technology can be installed in every building and for all tasks. What is hidden to the user's eye is the constantly perfect connection between sensors and actuators, but what the user sees are modern control elements that achieve a new level of sensor technology. Its total use is greater than the sum of its functions.

Products

Functions in top form

The details make the difference. Decades of the practical experience gained by electrical installers flow into every device, every user interface, every sensor and every actuator. Our product portfolio is always state of the art. The interaction between all parts allows components to be flexibly planned and brought into operation in a very short time. It is especially this that creates independence: one standard from a single source.



Switch actuator

Smart design: the return signal about the actual switching state of the connected loads creates transparency about the status of the building and facilitates maintenance.



DALI light regulator

Flexible regulation of light with the activation of up to 64 DALI participants in 16 light groups. Up to 14 light scenes can be controlled. With energy-saving constant light control and comprehensive staircase light function.



Blind/roller blind actuators

The automatic determination of movement time always ensures constant positions. Extended diagnostics messages prevent malfunctions. Integration into room temperature control helps to save energy.



Fan coil actuator

With two electronic outputs for electrothermal actuating drives, three outputs for the individual fan speed levels and an additional load output. A window contact and a condensate message can be transmitted via KNX by the two binary inputs.



Busch-ComfortTouch®

Its new visualisation increases user-friendliness: the entire multi-media world can be easily controlled via the touch screen, clearly, with realistic graphics and thanks to the swiping function.



Standard control elements

Fully diverse: rockers can be assigned set functions – perhaps to call up one light scene each. This converts a four-gang control element into an eight-gang control element.



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