



绿色楼宇

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## 高效 & 智能 / Efficient & intelligent

### 节能：

- 使用KNX遮光控制  
高达40%
- 使用KNX单间控制  
高达50%
- 使用KNX照明控制  
高达60%
- 使用KNX通风控制  
高达60%

### Energy savings:

- up to 40% with KNX shading control
- up to 50% with KNX individual room control
- up to 60% with KNX lighting control
- up to 60% with KNX ventilation control

对能源有效的计划和管理的楼宇不再是唯一的。即使“智能楼宇”的描述也开始失去其特有含义。两种趋势目前正在彻底改变日益雄心勃勃的建筑学并在世界范围内设置了对抗气候变化的学科。

在现实中，在建筑领域的能源对话在很大程度上已成为一种趋势并且逐渐成为建筑师和建造人员的日常概念。由于近期每年多发的自然灾害，不管是大的还是小的，我们都可以看到不断加强的失衡的影响。所以，迫使我们展望未来和为我们的社会活动承担起责任。

在楼宇的建设以及使用过程中，使用了大量的能源，因为这个原因在此领域有目标的使用能源就尤为有效。这并不意味着最终的目标是一个“零能源住宅”，将全部设备的智能网络分隔为完全分布式系统，带来了预料之外的节约。一个单一安装总线系统中的所有电气功能网络化为最佳协调控制提供了机会。供暖、空调、照明和窗帘的操作可以与外部气候条件关联，并且可以通过界面来控制。从而使能源消费保持在最小范围。既然所有的电气驱动设备和装置彼此间都可以灵活地组合，并能通过触摸面板或公共网络（电话、互联网）来控制，那么在设计和舒适这个领域将开启无限的可能。

现在呼唤设计师的创造力，以接近创作出生态型和利益型兼具的有表现力和令人震撼的建筑这一目标。  
有一点很明确：我们控制气候变化！

**Buildings that are energy efficiently planned and operated are no longer unique. Even the description “an intelligent building” is beginning to lose its exotic nature. Both trends are presently revolutionising the increasingly ambitious architecture and setting a course in the worldwide**

### fight against climate change.

In reality, energy conversation in the building sector has, to a great degree, become a trend and has slowly become an everyday concept for architects as well as for building constructors. Due to the recently recurring annual natural disasters, both large and small, we can see the impact of the increasing imbalance. We are, therefore, forced to look to the future and take responsibility for the actions of our society.

During the construction of a building, as well as during its operation, large amounts of energy are used, for this reason targeted usage in this area is especially effective. This does not necessarily mean the ultimate goal should be a “zero-energy house”; alone the intelligent networking of all devices to a decentralised complete system brings unforeseen savings. The networking of all electrical functions in a single installation bus system provides the opportunity for optimal coordinated control. The operation of heating, air-conditioning, lights and blinds for example can be aligned with external climate conditions and be controlled from an interface. Energy consumption is thereby kept within minimal boundaries. Since all electrical driven equipment and installations can be flexibly combined with one another and can be controlled by touch panels or by public networks (telephone, Internet), in the area of design and comfort this opens up almost unlimited possibilities.

The creativity of the designer is now called upon, thereby bringing closer the goal of creating expressive and thrilling architecture which is both ecological and profitable.  
One thing is clear: **We control climate change!**

## 用KNX进行可持续发展的设计

家居和楼宇系统技术唯一的开放式国际标准使照明、更高效能源和减少生命周期成本上有无限的设计空间。

无论是希思罗机场5号航站楼还是苏黎世湖边雄伟的住宅，一个用于控制一栋大楼里不同设备的统一的标准将更加容易地实现具有创新性和复杂性的建筑理念。无故障和多功能网络操作及能源经济使用是有效控制楼宇成本的重要标准。

### 国际统一标准

标准的电子装置在某种程度上可以独自完成这些要求，同时也需要更多的工作和物质投入。所以，越来越多的规划者和投资者选择基于国际标准KNX（以前是EIB）的家居和楼宇系统技术。通过使用多功能传感器和执行器，可以在一个方便的，有效控制成本的极其灵活的且随时可扩展的网络系统中来操作供暖、空调和安全装置。KNX家居和楼宇系统技术目前已经彻底改变了传统的建筑设施。这可通过不论是新建的还是翻新的楼宇中的实现展示出来。工业、商业、公共和私人住宅使用此技术已超过15年。

### 使用灵活

经常在建设规划过程中没有考虑到后续的使用和未来修改空间的要求。这个疏忽很快变成昂贵的涉及巨大成本的后续改造。这就是KNX标准提供的高水平灵活性所在。此总线系统几乎不花什么费用就可以再重新编程。所以，一栋住宅可以很快

变得满足新的需求或完全用作新的用途。

### 系统优势

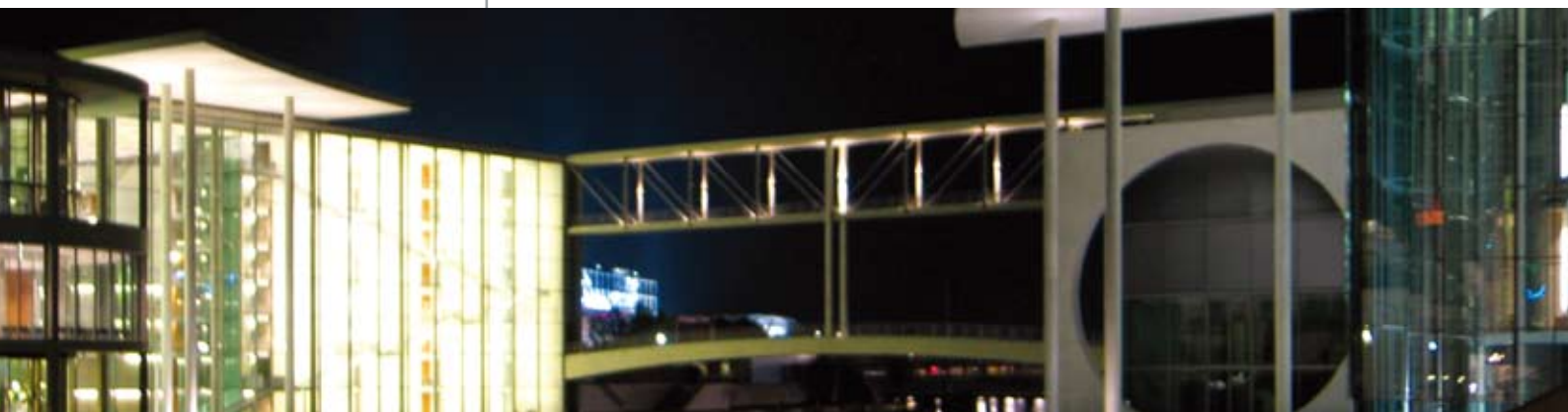
在使用过程中，系统优势显而易见：更高的操作可靠性；楼宇控制的无限可能性；不断增加的通信需求；或安全性和能效性。KNX聪明地解决了降低能源需求的问题：目标是单个房间的供暖和空调控制。KNX调控整体温度并与单个房间和时间周期联系起来。降低无人居住房间的温度，使节能达到最大化。

照明和遮阳也可一起工作：可以是窗帘挡住太阳以防止房间过热，也可用太阳的温暖来暖和房间以节约热能。也可在遮阳的位置调光。而且窗户的位置，无论是打开还是关闭，以及房间里人的数量也会影响供暖和照明的控制。

在集成楼宇系统技术方面可通过KNX安装一个安防系统。如果门窗关了，如果设备关机了，如果不希望的客人进来了，或如果发生火灾了，通过总线都会显示出来。

除了用于照明、遮阳、供暖、音频/视频、安防及能源管理外，KNX还能实现楼宇自身的内部通信系统。经过设计师设计的触摸面板上所有相关的家居和楼宇状态都显示出来。此外，通过接口将数据从外部传输到用于安防或维护服务的上级控制系统。所以，问题或故障都能很快被解决。

另外，KNX减低了布线要求及有关的火灾风险。只要这种总线技术能正确实现，就开始进行成本补偿。由于节能和运



营成本的减低，来自出租、额外舒适度以及最佳安防增加的收入，这个投资短期内即可收回成本。更高的成本效益导致增加市场机会，特别是转卖的时候具有更高的收益。

#### 国际制造商协会

KNX家居和楼宇系统技术背后是拥有100多家会员公司的KNX协会。这个主要的制造商协会提供了广泛的百分百兼容的产品。所有带KNX商标的产品都按KNX协会制定的统一的技术和质量规范进行了认证。这是KNX与其他总线系统相比的独特之处。KNX代表了未来安装和新一代设备，以及业内专家继续教育的进一步发展。



## Sustainable design with KNX

**Unlimited scope for design in lighting, higher energy efficiency and reduced life cycle costs due to the only open worldwide standard for home and building systems technology.**

Whether it is in Terminal 5 of Heathrow airport or an ambitious house on Lake Zurich, a uniformed standard for the control of different devices within a building would make the implementation of innovative and complex architectural ideas much simpler. Here, the failure-free and cross functional networked operation as well as the economical usage of energy are important criteria for the cost effectiveness of such buildings.

### **International Uniform Standard**

Standard electronic installations alone can only fulfil these requirements to a certain extent, while also requiring increased work and material input. Planners and investors, therefore, increasingly choose home and building system technology based on the international standardized KNX (formally EIB). By using cross functional sensors and actuators the heating, air-conditioning and safety installations can be operated in a convenient, cost-effective and exceedingly flexible network system, which can also be expanded at any time. The KNX home and building system technology is today already revolutionising traditional building utilities. This is shown by

increased implementation in both new and renovated buildings. Industrial, business, public and private properties have been fitted with this technology for more than 15 years.

### **Flexibility in Usage**

Often during construction planning the subsequent usage and future modified space requirements are not considered. This negligence can rapidly become costly as subsequent alterations usually involve enormous costs. This is where the KNX standard offers a high level of flexibility. The bus system can be simply reprogrammed with little expense. A property can thereby quickly be altered to accommodate new demands or completely new uses can be introduced.

### **The Strengths of the System**

While in operation the strengths of the system are clearly visible: be it through higher operating reliability; almost unlimited possibilities in building control; due to increasing communication demands; or security and energy efficiency. KNX intelligently solves issues dealing with the reduction of energy requirements: the goal being the individual room control of heating and air-conditioning. KNX regulates and controls global temperatures in connection with individual rooms and time periods. In non-occupied rooms the temperature is reduced, resulting in a maximum of energy savings.



Lighting and sun blinds also work together: either the blinds block the sun to prevent the room from overheating or they allow the sun's warmth to heat the room to save heating energy. The lighting would also be dimmed dependent on the sun blinds' position. Also, the position of the windows, whether open or closed, as well as the number of people in the room would be detected influencing the control of both heating and lighting.

In terms of the integrated building system technology a security system can be installed via KNX. Over the bus it would be indicated if doors or windows were closed, if equipment was switched off, if unwanted guests were in the building or if a fire had broken out.

Besides being used in lighting, sun blinds, heating, audio/video, metering, security and energy management, KNX can also be implemented for the building's own internal communication system. Over designer touch panels all relevant home and building states are indicated. Additionally, data can be transmitted externally via an interface to a superior control system for security or maintenance services. Problems or breakdowns can, therefore, quickly be resolved.

Additionally, KNX reduces wiring requirements and the associated risk of fire. The bus technology can be correctly

implemented from the beginning compensating for its own costs. The investment alone can be written off after a short period of time as a result of reduced energy and operating costs, increased income from rents, additional comfort and optimal security. Higher cost-effectiveness with higher yields results in increased market opportunities, especially when reselling.

#### **International Manufacturer Association**

Behind the KNX home and building system technology is the KNX Association with a membership of over 100 firms. This major manufacturer association ensures a wide range of available products, which are one hundred percent compatible. All products carrying the KNX logo are accredited according to uniform technical and quality guidelines set out by the KNX Association. This makes KNX unique when compared to other bus systems. Likewise, KNX stands for continual further development of future installation and equipment generations as well as for the further education of specialist within the industry.



《如果楼宇不被人们所喜爱，那么它对持续性发展可能是最有害的。》  
*«If buildings are not loved by people then it is most probably detrimental for the complete sustainability.»*

## 生命周期成本 Life cycle costs



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《可持续性存在三个领域：社会、商业界和环境。现在的情况是：我们以这样一种方式去做下一代生活的这三个领域。重要的是住在这些楼宇里的人们是最幸福的。当一个人感觉好了，有舒适感了，那么那个人就会关心它和每一个事物，这就是社会可持续性发展。》

《外墙是楼宇外壳最重要的部分。它把里外分隔开，那就是说，通过楼宇外壳，当然，也就是通过外墙，热量完全丧失了。这提供了一个非常大的贡献。外墙也肯定能在夏天阻止过多的热量——所以，它有各种功能。》

《如现在认识一样，生命周期成本在15-20年后与建筑成本一样高。而且，生命周期成本是持续性的。这个规定的原则是适用的：我们应该建立这样一种方法，即不要给下一代太高的生命周期成本。否则我们将不再能使用这些楼宇。我的观点是，生命周期成本对于经济是最重要的。如果我现在尽量去减少后续的成本，生命周期成本，那么我可能会有稍高一点的投资，但会降低维护成本。我们想说明：如果你建造一座具有可持续性标准的楼宇，那么这对长期的运营是有利的。》

《The sustainability is in three areas: society, the world of business and the environment. The situation here is that we behave in such a way that the next generation can live in these three areas.

The central point is most certainly the well-being of the people who live in these buildings. When a person feels good, when cosiness is present, then that person will look after it and everything will belong to society's sustainability.»

《The façade is the most important part of the building's shell. It divides the outside from the inside, that means, the complete loss of heat through the shell of the building is, of course, via the façade. This could provide a very big contribution. The façade must also, of course, protect against too much heat in the summer – it has, therefore, various functions.»

《As we are today aware, the life cycle costs are, after 15-20 years, as high as the construction costs. Furthermore, the life cycle costs are continuous. And here the principle of provision is applicable: we should build in such a way that the life cycle costs are not too high for the next generation. Otherwise we will not be able to operate these building anymore. The life cycle costs are, in my opinion, of central importance in regard to economics. If I were to now try to reduce the subsequent costs, life cycle costs, then I may possibly have a slightly higher investment but there will be less maintenance costs. We want to show: if you build a building which has certain sustainability criteria, then this will be profitable in the long run!》





《…一个人尝试去运营这个楼宇，那么，它总在理想情形下管理，楼宇在理想情形下调节自身。》

« . . . that one tries, to run the building so it always runs in the ideal situation, the building regulates itself in the ideal situation. »

## 中性能源消费 Neutral energy consumption



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《…整个形势肯定是定义了很多舒适性的问题，如照明。非常重要的一点是外观图——指对周围环境的参照。然后才是一个房间的声学问题——这也是非常重要的一点。目前一个很大的议题是：我能容忍多少噪音？》

《总的来说，我的观点是楼宇外壳有和人的皮肤一样的功能。我认为区分外墙和楼宇是无关紧要的，它应该是单一因素。》

《静态的外观已经过时了，代之以动态外观。从事航天工业的人们正讨论在住舱使用纺织品…当你考虑这些纺织品能做什么，能实现什么时，他们甚至已想到用这些材料做外墙，一个疯狂的想法是——也许我们将长期住在帐篷里！》

《…对我来说显而易见的是，系统不能控制人，它只在背后默默无闻，我其实不介意…要么我们用语音识别，这样就可以简单的进去说：我想让房间变暖或变凉或我想更亮。》

« . . . the whole situation is, certainly, lighting, which defines much cosiness. A very important point is the outside view – a reference to the surroundings.

Then the acoustics of a room – a very important point. Nowadays a very big subject: how much noise can I tolerate?»

«I am, in general, of the opinion that the shell of a building has the same function as human beings' skin. I am of the opinion that differentiating between the façade and the building is irrelevant and that it should be a single factor.»

«The static façade has gone in favour of a dynamical façade. People in the space industry are now talking about using textiles in the living quarters. . . . When you look at what these textiles can do, what they achieve: that one even thinks about using these materials for façade, a crazy idea – maybe long-term we will be living in tents!»

« . . . for me it's obvious, that the system may not control the people, it simply is there silently in the background, I don't really care. . . . either we use speech recognition, so one can simply go in and say: I want room to heat up or cool down or I want more light.»



《我相信建筑将会经历一个小小的复兴，并赢得人们的关注，不仅仅是他们对居住的要求，还有对能源的要求。》

«I believe that architecture will experience a small revival and will gain a certain existential importance for the care of people, not just accommodation but also with the energy they will require.»

## 楼宇产生自己的能源

### Buildings producing their own energy



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《正如你所见，这个车站的整个大厅由玻璃覆盖。由于使用电气单元，太阳能电池，许多组件都集成在一个太阳能模块中，我们用一个重复的符号，类似方格，这些是世界建筑业中非常适用的图案。》

《此刻，我们正体验，能源的政治议题离进入议程还有多远。所以，我们可以说建筑已成为政治。并且我发现这非常令人激动。没有使用太多矿物能源的楼宇，对保持国家独立是有贡献的。我们将有一个不依赖管道或能源注入，而为自身提供能源的文明社会。》

《如果这个可持续性也是能源的可持续性，那将是最理想的。一座建筑不应该是一个不停地注入能源，再散发出热量的“雄火鸡”。它应该是具有慢的能源流入，使其具有能源效率的建筑，另一方面，也有部分能源从建筑的外壳得到。》

«As you can see, the complete hall of this station is covered by glass.

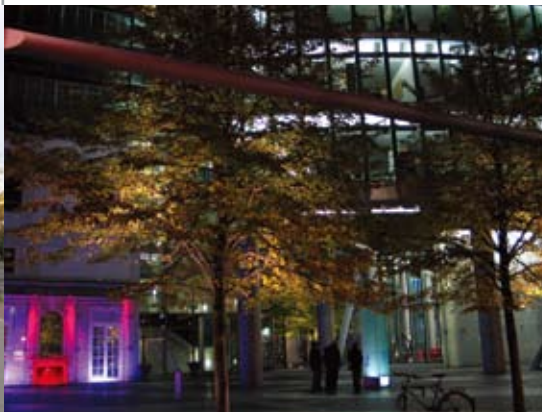
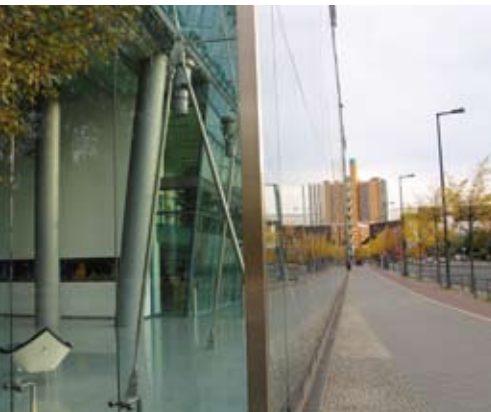
As a result of the electrical unit, the solar cells, a multitude of which are in a solar module, we have a repetitive character, similar to tiles, and these are very usable patterns in the world of architecture.»

«We are experiencing, at this moment in time, how far energy political themes have climbed up the agenda.

We can, therefore, say that architecture has become political. And I find this extremely exiting.

A building which does not use too much fossil energy is, therefore, also a contribution in helping a country become independent. We would then have a civilisation which does not hang on a pipeline or injection, but can provide for itself.»

«It would be optimal if the sustainability was also sustainability of energy. A building should not be a «gobbler» and always having energy pumped into it and then giving out warmth. It should be a building which has a slow energy flow as a result of energy efficiency and, on the other hand, also a part of the energy is available from the shell of the building.»



«…人们认识到差不多全部能源的一半都消耗到基础设施上，比如建筑上。」  
« . . . Then one realises that almost half of the total energy consume flows into the infrastructure, into buildings for example. »

## 下一代的可持续性 Sustainability for generations

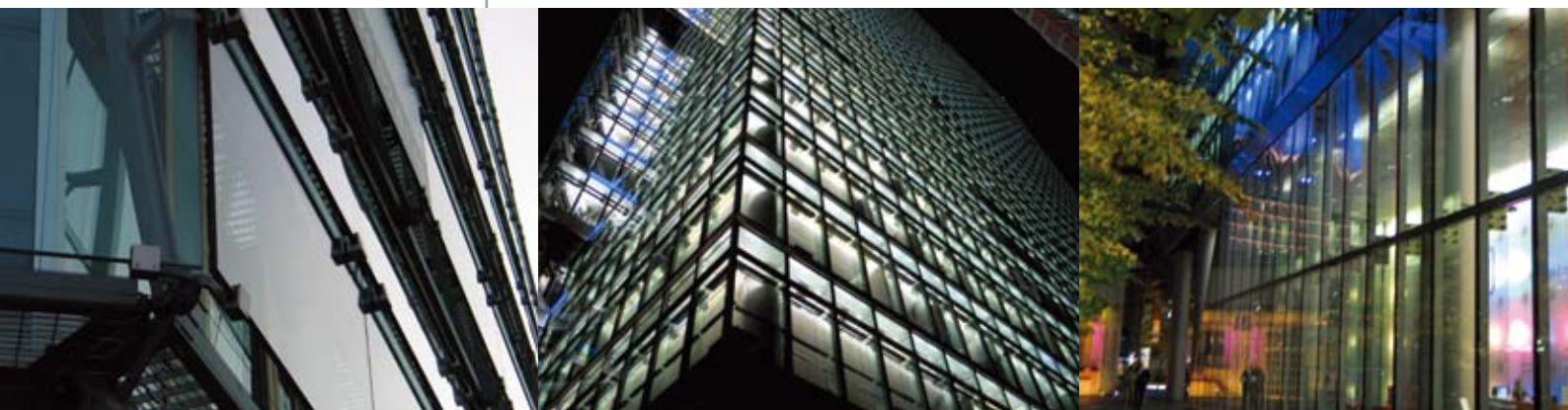


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«…满足目前这一代的需求——我们的——这样的方式不会降低下一代需求的满意度。」

«... With the satisfaction of the present generation's needs – ours – in such a way that the satisfaction of future generations' needs are not reduced.»



《现在的问题是：什么是舒适？如果人们想从哲学观点思考这个问题，那么这个范围非常广。》

«The question here is: what is comfort? This is very extensive, if one wants to philosophize.»

## 集成家居控制 Integrated home control



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«我认为这并不一定意味着仅仅从技术的角度来看待舒适问题，而且还要看房间给我们的印象，房间对我的影响以及感觉。而不只是根据房间的功能建造房间，对人类来说有更多的内容在其中。»

«我认为，人们常常试图建造一座玻璃外墙的透明建筑。玻璃总是与透明等同起来，但透明比只使用一种材料要求的要多得多，这经常被忽视了。当然，人们也可以用新材料。但对我而言，如果这也不能用另一种方法解决的话，那么总是质疑所用的材料。»

«I believe that this would not necessarily mean that I look upon comfort only from the point of view of technical values but it also has to do with the impressions given by the rooms, the effect the room has on me and the perception as such.

And not that rooms are only built which are purely defined according to their function and then the rooms just function. For human beings there is much more to it.»

«I think, people often try to build a transparent building with glass facades. Glass is always tantamount to transparency, but much more is required than just using one material, this is often underestimated.

Of course, one can also use new materials. For myself, however, it is always the case of questioning the materials which are used, if this could not also be solved in another way.»



《集成这些业务是一个总的趋势，以便经营者获得这些数据。》  
 «It's an overall trend, that these trades become integrated, so that the data will always be available for the proprietor.»

## 协调和网络化

### Coordination and networking



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«为了节约能源，我们必须知道，在哪儿用了能源，用了多少，那就是使用网络的地方，这样，我们就能提供信息给那些能源负责人，以便他们能看到，各种消费是什么。」

«每一个优化措施，人们应该确实去检查，它们是否有期望的结果。网络对监控很有帮助，它能使能源流高效和正确控制。」

«In order to conserve energy, we must know, where the energy is being used and to which amount, and that's where networks come in, so we can offer information to those responsible for energy, so they can see, what the various consumptions are.»

«With each optimization measure, one should really check, whether they have the desired outcome, and networks can be usefull in order to supervise this. It allows an efficient and correct control of the energy flow.»



《可能很少有领域像照明一样，如此激动人心并游走于设计与技术之间。》  
 «There are probably few areas, which are so exciting and swing back and forth between design and technology like lighting.»

## 照明设计和能源效率 Lighting design and energy efficiency



**Thomas Mika**

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《能源效率通常是问题，照明设计师已注意到… 我们可能受这样的事实影响，即任何人都能看见灯，任何一个路过建筑的人都能看见灯亮着，但是比如空调在运行，人们却看不见。》

《为节能和发展智能高效的理想，我们必须在操作系统的可用性上关注使用期限，提供在这些区域的应用，在需要的地方把灯打开。》

《随着楼宇的建设和改造，首要的问题是，是否需要照明设计师。》

《…这是个大问题，可能我们要面临的冲突——但是个好冲突，它使我们更有创造力和活力！——这个冲突，使我们必须在艺术、建筑水平上开发新东西，但另一方面，在技术上它是要确实可行的。》

«Energy efficiency is generally an issue, and the lighting planners have noticed that... we are probably affected by the fact, that anyone can see the light, anyone who passes the building, can see that the light is on, but for example not, that the air conditioning is running.»

«To save energy and to develop intelligent and efficient concepts, we must mainly focus on the life span, on the availability of operating systems, that offer use in these areas and turn on the light, there where it's needed.»

«With the construction or redevelopment of buildings, the first question always is, whether lighting planners should be needed.»

«... it's a big problem, an probably it's also the conflict that we always face – it's a good conflict, for it leads to creativity and energy! – the conflict, that we must develop something on the artistic, architectural level, but on the other hand to found it on a technical base, so that it actually works.»



## 研究：能源效率， Bremen Study: Energy efficiency, Bremen

Hochschule Bremen  
www.iia.hs-bremen.de/KNX-  
Energieeffizienz

与KNX建筑系统工程密切联系的是控制百叶窗、窗帘、灯光系统、音响系统、供暖系统、空调系统以及其他技术装置的舒适性。而且据新的研究报告这个舒适性可节能50%。

Bremen大学2002新建的信息和媒体技术中心（ZIMT），配备了供暖和照明KNX控制系统。

记录的数据会被评估，一个“普通的”案例会和“KNX”操作进行比较。一座楼宇有60~75 kWh/m<sup>2</sup>的能源需求。

选两个相同的教室来做实验。

其中一个配备了加热器的标准温控器，另一个配备了KNX控制。

KNX控制的房间安装了窗户开关、加热器阀、一个房间温度控制系统和一个热量仪表。

数据分析结果是非常肯定地，KNX控制的房间比标准安装的房间能节省50%的能源。

**Closely connected with the KNX building system engineering is the comfort of controlling shutters, blinds, lighting system, audio system, heating system, air-conditioning system and other**

**technical installation.**

**Furthermore this comfort brings energy savings of up to 50% as new researches documented.**

The 2002 new constructed center for Information and Media Technology (ZIMT) at the University of Bremen, was equipped with KNX controls for heating and lighting..

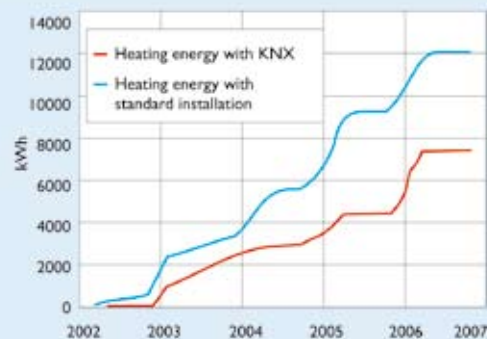
The logged data was evaluated and a “normal” case was compared to the “KNX” operation. The building has a specific energy demand of 60-75 kWh/m<sup>2</sup>a.

Two identical class rooms to select for their experiments.

One of them was equipped with standard thermostats for the heaters and the other one was equipped with KNX control.

The KNX controlled room was installed with window switches, valves on the heaters, a room temperature control system and a heating meter.

The result of the data analysis is very positive as the KNX controlled room could save up to 50% energy as compared to the room with standard installation.



## 希思罗5号航站楼，伦敦 Terminal 5 Heathrow, London

*Electrical Engineer: AMEC,  
Crown House & Balfour  
Betty*

*KNX System integrator  
KNX system integrator:  
Andromeda Telematics  
Limited, Surrey*

希思罗5号航站楼设计用于每年接纳超过3000万的旅客。其基础设施需要很好的照明配备和安全维护。

经过仔细的评估后，英国机场管理局BAA决定用能提供安全性、稳定性和互操作性的KNX作为总线系统。KNX设备的分散位置大大减少了布线量。

而且决定使用IP作为KNX系统主干线，用局域网进行长距离通信。这种组合使得长距离上有可靠的KNX网络。所有的KNX组件都被送到已布好线的控制面板上进行合理安装。

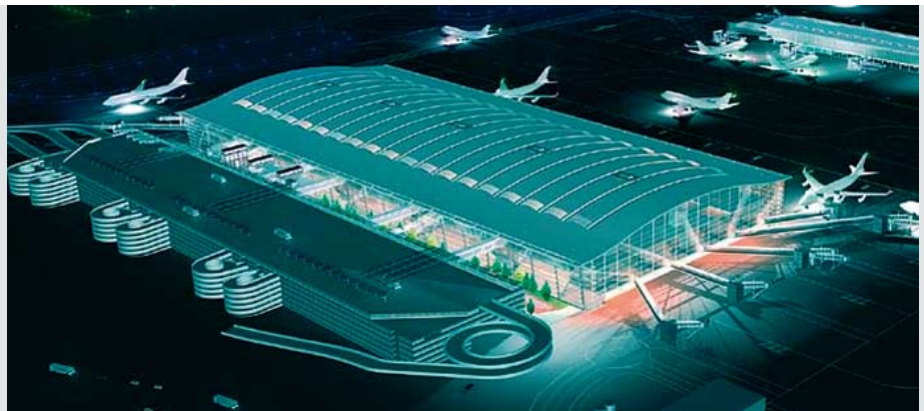
BAA的要求之一就是监视和操作单个楼宇管理系统的所有的子系统。

**Terminal 5 Heathrow is designed to receive more than 30 million passengers in a year. Its infrastructure needs to be well-lit and safely maintained.**

After careful evaluation, the British Airports Authority BAA decided to use KNX for the bus system which offers safety, stability and interoperability. The decentral location of KNX device massively reduces the amount of necessary wiring.

Furthermore it was decided to use IP as the backbone for the KNX system and to use the local area network for the communication over long distances. This combination allows a reliable KNX network over long distances. All the KNX components were delivered on pre-wired control panels for rational installation.

One of the BAA demands was the monitoring and operating of all sub systems from a single building management system.





## Artok别墅， Cairo Villa Artok, Cairo

*Architect: Artok group ,  
Kairo*

*KNX Systemintegrator /  
KNX system integrator: El.  
Eatamad Co., Kairo*

这个家建造在童话般的东方风格中，完美无缺。除了美丽的建筑外，还有KNX技术提供的无限舒适性。

全部使用KNX网络的优点：可使用来自网络任何部分的所有数据点，例如：中央可视系统。别墅的可视系统由一个触摸面板来控制，它根据住户的需求提供日、周、年的计划控制。

为了操作和控制，有一个所有KNX应用的图解表示法。可视系统也可控制逻辑链接，如：基于温度的遮光控制。

对于这个项目，承包商El. Eatamad公司可利用近几年在埃及建造的许多项目，如饭店、办公楼、体育馆和电影院中积累经验。

**The home is built in a fairytale oriental style and leaves nothing to be desired. Aside from the beautiful architecture, there is appropriate KNX technology to provide indulging comfort.**

The advantage of a complete KNX network: all data points can be used from any part of the network, e.g., for a central visualization system. The visualization system for this villa is available on a touch panel and offers daily, weekly or yearly scheduled controls depending on the demands of the residents.

For the operation and control, there is a graphic representation of all KNX applications. The visualization system also controls logical links like the shading control based on temperature.

For this project the contractor El. Eatamad Co. could draw from past experience with many projects like hotels, office buildings, gymnasiums and movie theaters that have been built in recent years in Egypt.



## 低能耗住宅，Innsbruck

### Low energy consumption house, Innsbruck

*Concept and KNX system integrator:*  
Rene Rieck, Austria

*IMPRESSUM*  
Green buildings

*Begleitheft zur Videoinstallation von Christoph Oertli*  
[www.christophoertli.ch](http://www.christophoertli.ch)

*Fotografien:*  
Eik Frenzel  
Christoph Oertli

*Konzept und Gestaltung:*  
I/E/U AG Consulting  
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用KNX提供的环保的供暖控制技术是获益的关键因素。有效的供暖系统如热泵通过KNX可进一步优化。

建筑所有者想对一个经得起时间考验的现代的、舒适的且节能的技术进行投资。具有中央控制功能和允许备用操作的供暖控制系统对建筑所有者是很重要的。带音频视频控制的系统扩展性，以及带可视显示的某个区域的访问控制、自动遮阳控制，热辐射地板系统的单个房间的温度控制和可控通风系统也是客户的需求之一。

KNX控制系统的挑战是遮光和供暖系统之间的协作问题。每年大楼150 m<sup>2</sup>共250 到300欧元的低供暖能源成本只有这些戏通间良好协作才能达到。

**The control of environmentally friendly heating technology with KNX turns out to be a key factor for profitability. Efficient heating systems like the heat pump are further optimized through KNX.**

The building owner wanted to invest into a modern, comfortable and energy saving technology that would stand the test of time. It was important to him to have central control functions and a heating control system that would allow standby operation. The expandability of the system with audio and video control was also one of the customer's demands, along with access control of certain areas with visual display, automatic sun shading control, the individual room temperature control of the radiant floor system and a controlled ventilation system.

The challenge for the KNX control system was the interaction between the shading and the heating system. The low heating energy costs of this building with 150 m<sup>2</sup> totalling between 250 to 300 Euros per year could only be reached through the smooth interaction of these systems.



# 家居和楼宇控制国际标准

## KNX会员

															
															
															
															
															
															
	<p><b>节能:</b></p> <ul style="list-style-type: none"> <li>• 使用KNX遮光控制 高达40%</li> <li>• 使用KNX单间控制 高达50%</li> <li>• 使用KNX照明控制 高达60%</li> <li>• 使用KNX通风控制 高达60%</li> </ul> <p><b>Energy savings:</b></p> <ul style="list-style-type: none"> <li>• up to 40 % with KNX shading control</li> <li>• up to 50 % with KNX individual room control</li> <li>• up to 60 % with KNX lighting control</li> <li>• up to 60 % with KNX ventilation control</li> </ul>														
															
															
															
															



[www.knxchina.org](http://www.knxchina.org)