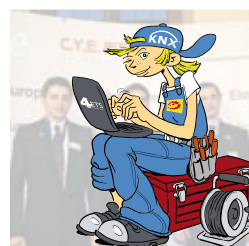




Photo courtesy of "WorldSkills International"



www.knx.org

Generation KNX

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Generation KNX at WorldSkills 2011 in London

The international 2011 WorldSkills Competition in London for the first time based on KNX



Richard Sagar who won gold in Worldskills Calgary 2009

The popularity of conventional installation methods not using bus technology is set to decline in the near future. For this reason, it is very important that apprentices and those at the beginning of their careers are familiarized with bus technology and building control right from the start. KNX, as the only provider of a globally-standardized bus technology, is therefore proud to announce that the international WorldSkills competition will be based on KNX only from this year's competition in London onwards.

In many vocational schools, a large amount of potential for good, interested apprentices lies dormant. Modern technologies require skilled experts who, once they have completed their apprenticeships, can continue to work in innovative companies providing comprehensive services.

The home and building control of the future will require highly-trained professional people. The KNX bus technology presents an excellent opportunity for companies to provide young professionals with good prospects after their apprenticeship is



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finished, and thus bind them to the company.

WorldSkills London 2011 puts its trust in KNX

Following the general trend in home and building technology, the organization of WorldSkills has decided to base its competition on KNX. The venue for this world premiere will be ExCel, London, October 5-8 2011. In this 41st ever WorldSkills International Competition, teams from 50 different countries will be competing. The KNX technology will play an important role: the practical tasks will include work relating

to KNX, hence every candidate will need to be familiar with the KNX technology. KNX, as the worldwide BUS standard equally accepted in all countries, is an ideal technological platform for this international professional competition.

KNX: a valuable asset also after the competition

"The youth of today is open to change: we are obliged to give them the opportunity in the future to get involved in the exciting sector of electro-technology and KNX. We hope that all the participants

enjoy the competition and wish them every success with KNX," says Stephan Bauer, President of the KNX Association. KNX Association, its members as well as training centers and KNX partners have invested a great deal to ensure that the young generation's knowledge on KNX is improved. New KNX Training centers have been set up in many new countries, reaching a total of 185 KNX Training centers in 35 countries! Already today many contestants and experts of WorldSkills are listed as one of the 25,000 certified KNX Partners.

WorldSkills is a competition for non-academic professions for participants up to 23 years old. This event is held every two years. This Olympics of professions has more than thousand participants. The competition consists of 40 major professional disciplines. In Skill 18, the electrical installers are tested. The world's best electrical craftsmen will compete in London between 5 and 8 October.

More Info: <http://www.knx.org/worldskills2011>



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KNX in young competitions



KNX Award Young Generation

The Young Generation KNX Award shows excellent KNX projects of young people worldwide, that are leading in innovation and technological progress in the field of home and building automation.

National Young Competitions

On national level the respective electrical trade associations in each country take its responsibility. Since many years they organize competitions for young people of the electrical trade, based on KNX.



European Young Competitions

On European level the European Association of Electrical Contractors (AIE) organizes the Competition Of Young Electricians, based on KNX, every two years. All participants were already victorious in a national competition and are sent to the European competition to represent their country.

Worldwide Young Competitions

On a worldwide scale the biannual event WorldSkills is organized. WorldSkills is a competition for non-academic professionals up to 23 years. The world's biggest skills competition for the artisanal sector consists of 40 Skill 18 the trade of electrical installation is tested, in 2011 for the first time based on KNX.



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Interview with Michael Hourihan, leading expert of the WorldSkills London 2011



Michael Hourihan - Chief Expert of WorldSkills London 2011 – Skill 18: Electrical Installations

What was your first experience with KNX?

During the expert's discussions following the World Skills Competition in Calgary in 2009 it was suggested by some experts that we should consider the use of KNX as part of the installation for the next Competition in London. Much discussion took place and the many advantages of KNX were highlighted and it was decided that we would use KNX as an operating system for part of the main module in the 2011 Competition in London. This was my first exposure to the KNX system.

Why did you choose KNX as technology for the competition?

KNX was chosen because it is a worldwide system recognized and used all over the world. KNX equipment is manufactured by most manufacturers of electrical equipment and so KNX equipment is easily sourced. KNX equipment is designed to control many different systems including lighting, temperature control, security, audio/visual and communication systems. All these options opened up many possibilities for the design of the the particular module using the KNX equipment.

What do you expect from KNX in the competition?

Using KNX equipment in the World Skills Competition will expose electrical apprentices to a very modern and flexible energy management system. This can only be a very positive experience for all involved. As we all know, technology is changing very quickly and it is very important that we ensure that all young apprentices and engineers are familiar with the most up-to-date systems, and by using KNX in the World Skills Competition we are exposing everyone involved to a very modern and progressive system.

Attender at WorldSkills 2011 in London

United Arab Emirates	Taha	Jassim	Expert
Austria	Dominik	Rechberger	Competitor
Austria	Christian	Bräuer	Expert
Australia	Benjamin	Houghton	Competitor
Australia	John	Rudge	Expert
Belgium	Pierre-Olivier	Van Isacker	Competitor
Belgium	Denis	Devos	Expert
Brazil	LUCAS	SOUZA	Competitor
Brazil	Ivan T	Cortez	Expert
Canada	Timothy	Twa	Competitor
Canada	René	Jetté	Expert
Switzerland	Gian-Andrea	Casaulta	Competitor
Switzerland	Adrian	Sommer	Expert
Germany	Daniel	Wagner	Competitor
Germany	Klaus	Drasdo	Expert
Spain	Guillermo	Rull	Competitor
Spain	Juan Enrique	Pérez	Expert
Finland	Matti	Alarautalahti	Competitor
Finland	Osmo	Heikkinen	Expert
France	Pierrick	MANDIN	Competitor
France	Bernard	Finet	Expert
Hungary	Ferenc	Csikos	Competitor
Hungary	Zoltán	Kummer	Expert
Indonesia	Yudi	Azwar Hamid	Competitor
Indonesia	Zaenal	Arifin	Expert
Ireland	Michael	Hourihan	Expert/ChiefExpert
Iran	Sirous	Nakhodchi	Expert
Iceland	Arnar Helgi	Agustsson	Competitor
Iceland	Stefán	Sveinsson	Expert
Japan	Rikiya	Seki	Competitor
Japan	Yuji	Okano	Expert
Korea	Seon Jung	Hwang	Competitor
Korea	Sang Kook	LEE	Expert
Macao, China	Cheng	Ku	Competitor
Macao, China	Ka U	Chan	Expert
Malaysia	Muhammad Norsyazani	Abdul Kadir	Competitor
Malaysia	Mazlan	Abdullah	Expert
Namibia	Piet	Viviers	Expert
The Netherlands	Ruben	van Gemert	Competitor
The Netherlands	Pieter	Hoving	Expert
Norway	Bernt Erlend	Fridell	Competitor
Norway	Agnar	Holen	Expert
New Zeland	Shaun	McInerney	Competitor
New Zeland	Luke	Boustridge	Expert
Oman	Essa	Al zedjali	Expert
Portugal	Pedro	Cordeiro	Competitor
Portugal	André	Rodrigues	Expert
Saudi Arabia	ALI	ALKHALAF	Expert
Sweden	Andreas	Holmberg	Competitor
Sweden	Per	Svensson	Expert
Singapore	Shing Haur	Cheng	Expert
Thailand	Somboon	Sangtheerathiti	Expert
Tunisia	Taoufik	Benslimene	Expert
Taiwan	YI-CHIA	CHEN	Competitor
Taiwan	Min-te	Chang	Expert
United Kingdom	Christopher	Young	Competitor
United Kingdom	David	Thomas	Expert
Vietnam	Binh	Dang An	Expert

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Chat with generation KNX



Interview with the 1st winner of CYE 2010



Markus Stöger
(Austria)
1st Winner of CYE 2010

Can you tell us about your experience as a winner of the CYE2010?

For me, the competition was a very special experience, since this was my first time traveling abroad and flying in an airplane. I was able to adapt myself quickly to the environment thanks to my seniors. At the competition itself, I could find my rhythm pretty quickly. It was pretty exciting to have the opportunity to take a look at the competitors every evening.

Based on your experience with KNX, can

you tell our readers the greatest advantage of the KNX Journal of the KNX tool?

I honestly have to admit, during the time before the competition started, my involvement in KNX was very less marked, because it was hardly used in my company. However, we were taught KNX at the vocational school very well. I like very much how KNX is based and structured. Of course, one of the big advantages is the variety of manufacturers and how quickly changes can be made according to the customer's demands.

Can you give our future participants some tips on KNX?

If you want to install such a system (KNX), it will be necessary to plan the installation accurately in advance.

Do you want to install KNX in your own home or apartment?

Since it will take a while until I have to think about this topic, I actually have not thought about this. However, I am very convinced by the KNX system and I will most likely install it for myself as well.



Interview with a KNX Partner from Italy



Jacopo Martino
Trento (Italy)
Partner Number: 27593
jmartino@hotmail.it

Why have you become a KNX partner?

Because my institute offered me this possibility. I think that this will improve my chances to find a good job.

What has fascinated you as a young person so much with KNX? Did you choose only KNX, or have you also got training in other systems? Why?

The possibility to create a system which is able to control entire buildings with only a PC or with appropriate controllers. I chose only KNX because it is the only course that was offered to me by my school.

Are you currently working in a company in which you are able to use your KNX skills?

If yes, in which kind of projects are you currently involved in (home or building projects)? Could you please list a couple of projects in which you have collaborated?

No, I am not working in any company now as I am still studying at a college but it could possibly happen in the future. Or at least I hope so.

Would you recommend the course to other young people?

Absolutely. This sector is still

„up and coming“ and it will keep developing. It is a future proof system that offers increasing possibilities.

If you are currently not working in a company, do you think that KNX will increase your chances to find a future job?

Yes, of course, that is the reason why I took the course.

In order to become a KNX partner, you have followed a certified training. What are your experiences with KNX?

I just got the certification after having followed the training.

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Young Generation from ITE College East Singapore: Opinions on KNX

1. "KNX is a smart Home automation system and its software ETS is simple to use. I would love to work with a company that is involved in KNX."

Sharul Aizad, 19

2. "KNX is an intelligent and smart system with a software ETS that is easy-to-use with minimal training. KNX is recognized worldwide. I am proud to be one of the users of the KNX system."

Mohammed Ruzaini, 19,

3. "KNX is a convenient and easy system for domestic and commercial projects. KNX helps save energy: the ease of use of the ETS software for programming KNX installations is very positive."

Suhaibatul, 18

4. "KNX is fun and interesting to learn. Once its concept is clear, it is easy to use. I am happy that KNX, the worldwide home and buildingsystem, forms part of my course as electrical contractor."

Mason Yap, 19

5. "In a modern world, where



technology is omnipresent, KNX simplifies life. People like me no longer want to do things the hard way. Home and building management is so much more convenient with KNX."

Muhammad Aidil, 19

6. "KNX is a system with an excellent software tool, ETS. KNX uses less wiring and saves energy."

Mohammad Danial, 18

7. "The KNX lectures are fun, interesting and not difficult. If I get the opportunity, I would love to learn even more and install KNX in the future."

Andy Chua, 19

8. "Of the module 'Electrical Contracting', KNX is the module that is by far the most enjoyable and interesting. I hope to learn more and join a company that works with the KNX system."

Kew Ying Heng, 18

9. "KNX is the best technology and ECO friendly. It saves energy, uses less wires and is recognized worldwide."

Muhd Norawan, 19

10. "KNX is such an advanced technology, that every future home should use it."

Nicholas, 18



Interview with the 2nd winner of CYE 2010



Bernt Erlend Fridell
(Norway)
2nd Winner of CYE 2010

What was your first experience with KNX?

My first experience with KNX was in vocational school, learning about the KNX-basics. After working for about one year in my company, I got my first wiring and programming job. The job was pretty big, and I took part in wiring, linking and programming.

What do you like best about KNX?

I like that you can buy components from different suppliers, and that everything works together independent of the brand-name. I do also like that you can choose very precisely how to create your own "setup".

Do you want to install KNX in your own house or apartment?

Yes, most likely. KNX gives me the opportunity to design my house the way I want, combined with the ability to easily expand the electrical system.

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Interview with the 3rd winner of CYE 2010



Arno Conradin
(Switzerland)
3rd Winner of CYE 2010

What was your first experience with KNX?

I had my first experience with KNX when I took part in a championship. I didn't know much about KNX before. I did know that it is a bus system for house automation, but not much more. So my first encounter was at the training's preparations of the championship. I was really surprised when along with my first steps I realized that applying KNX is definitely less complicated than I had imagined. Also the fact that the components of different manufacturers are compatible without a problem was an important realization. One aspect that makes it all a

little more difficult – the way I see it at least – is the fact that every manufacturer describes the possibilities to set the configuration in other words. As a consequence, dealing with not so well-known manufacturers problems can easily come up.

What do you like best of KNX?

Most of all I like the fact that you can be so flexible. Nowadays the least of customers know what exactly they want at the start of construction. After finishing the customer knows about his or her essential needs and what would be best to do. That's not a problem for me then, I can log

in, change a few connections, set some components in a different way – easily done. Wiring isn't necessary, it's very easy that way.

Do you want to install KNX in your own house or apartment?

Of course. Yet, it's still a matter of finance where advantages have to outweigh the disadvantages and the question if an investment into a standard rented apartment is worth doing remains open. Over time, I hope this technique will continue to develop and also make its way into a standard rented apartment.



Interview with a KNX Partner from Italy



Andi Frenademez
Bruneck (Italy)
Partner Number: 24795
andi.frenademez@gmail.com

Why have you become a KNX partner?

I became a KNX Partner because I see a lot of future in the KNX technology. In addition, the KNX home and building automation system becoming increasingly more important for instance for energy saving measure implementations.

What has fascinated you as a young person so much with KNX? Did you choose only for KNX, or have you also got training in other systems? Why?

I have been interested in the KNX technology since I started my professional career because home and building automation control systems and the need for energy savings have grown in importance. I have decided to

use the KNX system because it is a worldwide standard and because the variety of products in unmatched.

Are you currently working in a company in which you are able to use your KNX skills? If yes, in which kind of projects are you currently involved in (home or building projects)? Could you please list a couple of projects in which you have collaborated?

I work in our family business, the Electro Frenademez GmbH, where we are involved in the field of home and building automation system, of course based on the KNX system. My first project was the Museum Ladin Ursus Ladinicus in Sankt Kassian in the Gadertal, South Tyrol. It featured controls

for the lighting, heating and ventilation systems and was controlled by a touch panel.

Would you recommend the course to other young people?

Of course I can recommend this course as it is an additional qualification that will help your career. I completed the certified training in the vocational training center in Bruneck, South Tyrol.

In order to become a KNX partner, you have followed a certified training. What are your experiences with KNX?

I had good previous knowledge of the ETS as the ETS was a frequent topic during my professional education.



KNX ONLINE



www.youtube.com/user/knxAssociation



www.facebook.com/KNXAssociation



www.twitter.com/KNX_Association



www.linkedin.com/company/knx-association



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Comenius
Smart KNX Home
Europe



Comenius Smart KNX Home in Europe

Part of the Lifelong Learning Programme, Comenius seeks to develop knowledge and understanding among young people and educational staff of the diversity of European cultures, languages and values. It helps young people acquire the basic life skills and competences necessary for their personal development, for future employment and for active citizenship.

Comenius has the following goals:

- To improve and increase the mobility of pupils and educational staff in the EU Member States,
- To enhance and increase partnerships between schools in the EU Member States, with at least three million pupils taking part in joint educational activities from 2011,
- To encourage language learning, innovative ICT-based content, services and better teaching techniques and practices,
- To enhance the quality and European

- dimension of teacher training and
- To improve pedagogical approaches and school management.

About “The Smart Home in Europe”

The project application “THE SMART HOME IN EUROPE” devised by the following six secondary vocational colleges from six different countries was approved by Comenius:

- Technisch Instituut Sint-Lodewijk in Genk, Belgium,
 - Kokemäenjokilaakson Ammattiopisto, Kokemäki, Finland,
 - Istituto Tecnico Industriale Statale “Fermo Corni”, Modena Italy,
 - Kuniberg Berufskolleg Recklinghausen, Recklinghausen, Germany,
 - Vyšší Odborná Škola a Střední Průmyslová Škola Elektrotechnická Plzeň, Pilsen, Czech Republic and
 - Békéscsaba Central Vocational School and Student Hostel, Békéscsaba, Hungary
- The project aims at developing a home which includes the necessary technology

to allow for devices to be controlled automatically: a SMART HOME IN EUROPE. These homes can automatically control the temperature and the level of security and permit efficient communication with the outside world.

Initially, it was planned to start the project with a marketing research to identify:

- the needs of the target group,
- the necessary applications that have to be developed,
- price considerations and
- user-friendliness.

It was quickly discovered that such marketing research had already been conducted, and all the technical devices needed were on the market. It was also found that the smart technology was unknown to the majority of common people, and that it was not at all appealing to the target group (the elderly).

As a consequence, it was decided to change the focus from research to promotion in order to create a market for



Mr. Wide explaining the HWG Smart Home Philosophy



Some KNX Devices of TAMK



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"THE SMART HOME IN EUROPE".

First meeting in Recklinghausen, Germany

The project coordinators from the six schools met for the first time in Recklinghausen (Germany).

During that meeting they distributed work packages for The Smart Home in Europe: Promotion, Lighting, Heating, Communication, Video and Audio.

They agreed to use the KNX-system to produce compatible applications.

The group visited a Smart Demonstration Home in Hattingen using KNX, developed by HWG Bochum and the Fraunhofer Gesellschaft in Duisburg.

Second meeting in Kokemäki, Finland

The pupils presented their applications: German girls spoke about promotion, Finnish boys about lighting, Czech boys about communication, Hungarian boys about video and audio, Italian boys about solar energy and last but not least, Belgian boys presented a heating

pump for The Smart Home in Europe. In two workshops, the pupils learned how to develop promotion and how to program a KNX-system.

The group also visited the University of Applied Sciences in Tampere, where KNX systems are being developed and taught. (<http://www.tamk.fi/en/>).

Third meeting in Békéscsaba, Hungary

Sandor Kasoly, a teacher of the Hungarian school, prepared this meeting by following some extra KNX lessons in Budapest. He then trained his pupils on the latest KNX technology so that they could present the KNX philosophy to the students from the other countries. During a workshop, Sandor Kasoly explained the hardware and software connections between KNX devices for audio and video.

Prospects...

The project was followed by meetings in Italy (Modena), the Czech Republic (Pilsen) and Belgium (Genk).

Further projects are underway. The Technisch Instituut St. Lodewijk in Belgium and the Istituto Tecnico Industriale Statale 'Fermo Corni' in Italy are working on solutions for conserving energy. Students of the Békéscsaba Central Vocational School and Student Hostel, Békéscsaba in Hungary are working on audio and video control systems. And a team of budding electricians at Vyšší Odborná Škola a Střední Průmyslová Škola Elektrotechnická Plzeň, Pilsen, Czech Republic continue work on the communication technology in 'Smart Houses'. The main goal was to bring teachers and pupils of different countries together in a "Smart Home" equipped with the KNX standard.

More information:

<http://www.spse.pilsedu.cz/comenius/>

Pupils of the host school present KNX devices for audio and video



Teachers and pupils of "The Smart Home in Europe" in front of the town hall in Békéscsaba, Hungary (May 2009)



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Institute of
Technical Education
College East
Singapore



KNX Home Projekt in 4 Merino Crescent in Singapore

During the professional training of our engineers we are continuously facing the challenge to realize a training experience for the trainees which is as close to practical reality as possible. The young generation of ITE students has the chance to learn the KNX system as part of their studies at the Department of Electrical Engineering. The students at the ITE College East in Singapore have to put into practice what they have learned within their study time.

An excellent opportunity presented itself when the owner of the 4Merino Crescent Apartment Building offered a 3-story bungalow construction as a project where students could contribute to the work process. KNX Systems were to be integrated into the project.

Mr Lee Chee Meng and Mr Raymond Yeo led the project in cooperation with seven students of the Department of Electrical Engineering of the ITE College East.

The variety of work for the students during the project had the following contents:

- planning of the systems



- wiring in the electrical distribution box
- installation
- programming with KNX
- testphase and the starting up of the KNX system



Students wire the KNX devices in the distribution box
Planning and design in AutoCAD

The project offered ideal conditions for the students of ITE College East to cooperate in a real project. The trainees had to take several aspects into consideration. The standards for industry had to be respected, the deadlines had to be



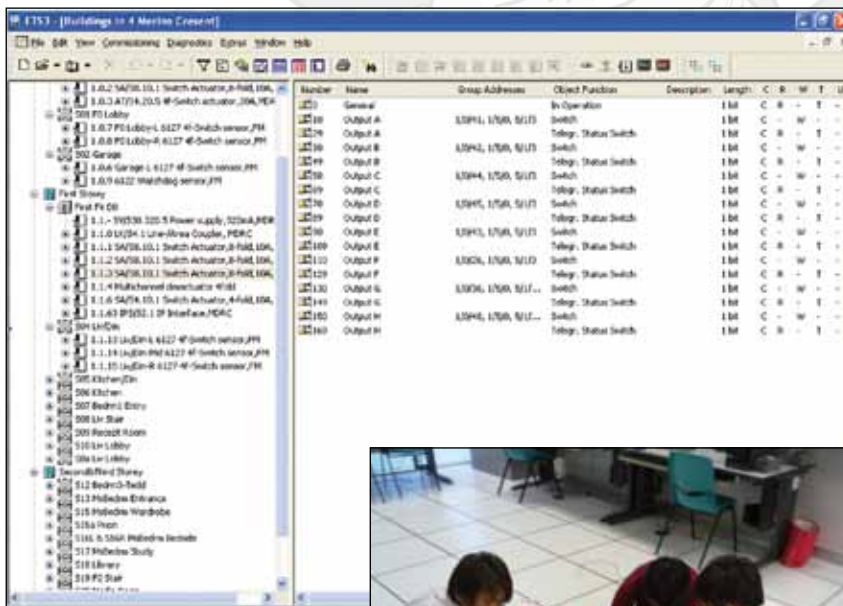
Project before Completion.



Project after Completion.



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ETS-programming of the 4 Merino Crescent, Singapore.



Students wire the KNX devices in the distribution box

met, and the work of the fitters on the construction site had to be coordinated in order to ensure that everything went off smoothly.

The CAD-program was used for the planning phase. KNX-equipment was wired in the distribution box.

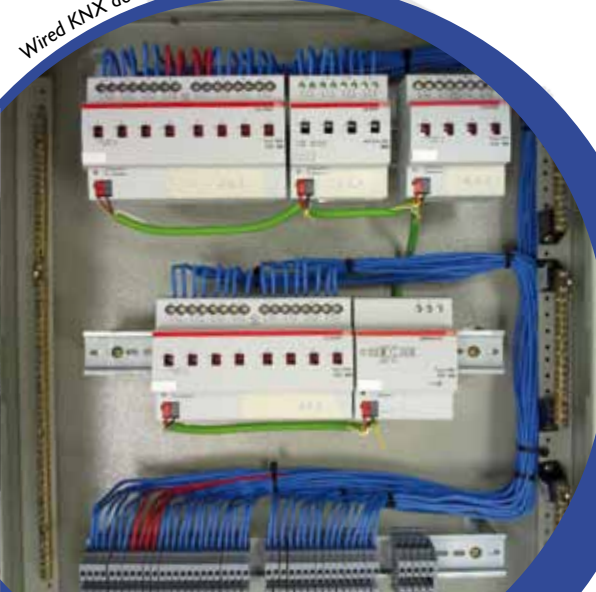
Later the students installed the distribution box in the basement and connected the wiring for lighting with the KNX-devices. ETS-programming was put into practice with the help of a laptop.

The staff checked the programming of the students before programs were run. The experience gave our students a better understanding of the work place, the surrounding that they can expect, and expectations they will have to face. The following quotation sums it up in short:

Things I hear, I'll forget.
Things I see, I'll remember.
Things I do, I understand.

More information:
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Wired KNX devices in distribution box.



Checking of the programming before project was started.



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TECHNISCHE
UNIVERSITÄT
DARMSTADT

TU Darmstadt
Darmstadt, Germany



A Journey to China

Intelligent Building Technologies Taught Practically

“I have been working at this test facility for a few weeks and it has been a lot of fun”, says Andreas Häufglöckner. Häufglöckner is a 26 year old engineering student at the Technische Universität Darmstadt (TUD) and is one of the first students to work with this new electric test facility. The test facility was adapted from the same system that was implemented in the school’s solar home that took first place in Washington D.C.’s Solar Decathlon 2009, as well as Solar Apartment, which was present in Beijing “Automation World” fair. This test facility gives students the opportunity to work with this technology in a research setting. The Solar Home, Solar Apartment and test facility are completely wired using intelligent ABB-building system technology.

The test facility is studied by both power systems engineering and electrical engineering students, like Andreas Häufglöckner. The student reported, “I was very busy learning how the electronic

devices interact with software”. Häufglöckner found the software integrated with the KNX system to be extremely user-friendly, “Even complex programs are possible for example to display individual consumption data for the Busch-ComfortPanel.”

“From now on, eight groups will work every semester at the test facility, to become familiar with the innovative products and applications of the KNX system in Smart homes”, states Dipl. Ing. Lutz Steiner, a research assistant and PhD. Student in Renewable Energies at the Technische Universität Darmstadt. TUD first constructed the test stand in order to focus on investigating building services engineering. The university’s primary objective is to study how the KNX system can be used in order to lower house consumption, which can often be much more cost efficient than improving solar panel production.

This test facility results from the TUD and ABB corporation in 2009 when the school teamed up with ABB to build their home for 2009 Solar Decathlon in Washington D.C. Steiner’s goal by

integrating the curriculum with the KNX system test facility is to give the students the opportunity to work with a product that has realistic applications in homes across the country.

User-Friendliness becomes Crucial

When Steiner and his team were deciding how they would organize their electrical control system for the Solar Home, they wanted a system that could handle a multitude of commands, but more importantly, a system that consumers could operate almost effortlessly. ABB’s KNX system satisfied both of those stipulations. The KNX system is a comprehensive organizational system of electrical energy consumption with a control panel where controlling the whole system seems almost inherent. Steiner was so impressed by the system that he adapted it to a test facility and allows students to study the system. By working with the system, Steiner hopes that the students can gain an understanding how to design a system that can be both technologically advanced, but so simple a child could operate it.



Energy consumption visualisation at the test facility



Andreas and Felix Feix are working at the test facility



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The KNX has many other uses than just turning lights on and off. „In addition to the photovoltaic system, lights, and home appliances, we have attached a KNX controlled power station and a KNX controlled PV backup battery storage to the stand“ said Steiner. „By doing so, we can measure the production of power coming from the Photovoltaic's, as well as monitor how much we have stored in the battery, all with the KNX system. We even added an electric charge station for electric vehicles into the system. By installing a KNX system in our test facility, we are able to study the system and some of its more advanced applications.

The freedom to experiment and research with the system helped Steiner and his associates greatly when it came to constructing the Solar Apartment in Beijing at the ABB „Automation World“ fair in May of 2011. TUD was able to use what they learned about the system in the test facility and implement it in this Solar Apartment over 7,500 kilometers away. Although the apartment was only nine by four meters in area, TUD and ABB

employees were able to integrate a PV backup battery storage and an electrical vehicle charge station.

Integration of local products with KNX

„The „Automation World“ fair in Beijing in May 2011 is the largest exhibition of its kind in the Southeast Asian region; about 2,200 visitors and ABB employees came to catch up on new products... the solar house apartment was a popular stop shop,“ says ABB's project manager Bernd Wagner.

The KNX system demonstrated that intelligent building electricity management can be integrated with distribution boxes in a very straightforward manner. Rather than being completely independent systems, KNX can create a very collaborative system that can actively monitor Smart Meter, intelligent home appliances, energy storage, energy consumption, energy production, as well as automatically control energy consumption using Smart Energy Demand awareness.

The apartment was fully furnished and boasted a plethora of household kitchen appliances, a television, lights, as well as the appropriate technology to attach solar panels. All technical equipment was fully functional, including a charging point for electric vehicles which was connected to the building. The whole electrical system was routed to a computer and could then be completely controlled by a handheld iPad. This integration of a user friendly controller made it very popular with the visitors of the fair.

„We have even built Chinese versions of home automation applications,“ says Wagner. „Together in a short time we have depicted a complex subject and have integrated highest reliability in the local market.“ This integration of local products could not be possible if it were not for the fact that the apartment was equipped with the KNX worldwide standard.

More information:
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Test facility



Solar house apartment at the ABB Automation World 2011 in Beijing



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University of Applied Sciences
Technikum-Wien
Department of Embedded Systems



TTU Vienna - Inst. of Computer Aided Automation Systems Group



ANT goes KNX

The demographic trend in industrial nations towards an aged population and a decline in birth rates requires new strategies to cope with the upcoming social and economic challenges. Ambient Assistive Technologies (AAT) offer a solution to increasing costs and needs in elderly care. They combine a wide range of technologies, methods and services with the aim of improving the quality of life of not only aging but handicapped people in general. AAT enable people to live independent and self-determined lives in their familiar homes with a certain level of comfort and safety. Thus, AAT are closely linked to technologies such as smart homes, building automation systems and also KNX.

The master thesis of Luka Samardzija aims at exploring new possibilities and realizing applications that emerge when vital signs data (e.g. the heart rate) become available in KNX installations. The main task is therefore the development of an ANT to KNX gateway in hardware as well as software. ANT is an ultra-low power wireless sensor network technology, which is well-established in the sports and fitness

equipment sector used, e.g., by heart rate monitors and pedometers to wirelessly transmit data from a sensor to a watch. Nowadays, ANT is becoming more and more used in the health-care and AAT sectors to be able to remotely monitor vital signs such as blood pressure, blood sugar and weight.

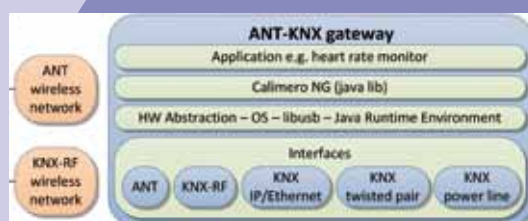
The first step within this project is to develop the required hard- and software system design for the ANT KNX gateway (Figure 1). A powerful embedded system is exploited as the base platform, where further components can be integrated. An open KNX RF interface (KNX RF interface based on TI's CC111x) will be engineered, while a USB-based ANT interface will provide ANT connectivity, thus realizing an integration of both wireless technologies (Figure 2). Standard interfaces (e.g. KNXnet/IP interface, TP- UART based TPI interface) will be used for other physical KNX media when appropriate. The software part of the gateway will consist of an embedded linux-kernel based OS with a JAVA runtime environment. Regarding the KNX software stack, the well-known Calimero NG JAVA library will be used as a basis and extended if required.

The combination of KNX and ANT is considered a highly promising first approach for future comprehensive AAT solutions. Therefore, a close cooperation between the Department of Embedded Systems, University of Applied Sciences Technikum-Wien and the Automation Systems Group, Vienna University of Technology was established to supervise this project and to further promote AAT approaches. The main expertise of the Department of Embedded Systems lies within the topics of AAT, supportive tools and smart home technologies, while the Automation Systems Group contributes its in-depth knowledge of building automation, smart homes, distributed control systems, and in particular, KNX. This student project shall allow to further emphasize the topic of AAT in research and development as well as in various courses and lectures held at both academic institutions.

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Evaluation board with ANT and KNX RF interface



System design





KaHo Sint-Lieven
University College
Gent, Belgium



YOUNG GENERATION



Young meets Old

A Demonstration Suitcase for Ambient Assisted Living as Student Project

As a project in the 3rd grade Faculty Electrical Engineering, three students from the KAHO Sint Lieven in Ghent/ Belgium have opted to jointly develop a suitcase, with which they can demonstrate the advantages of KNX and smart home technology for Ambient Assisted Living. The KAHO Sint Lieven is a long standing member of the KNX Scientific Partnership.

Ambient Assisted Living is the term used to designate the effort to try and keep elderly people as long as possible in their own home, by the use of smart technology in combination with a link to a service center, which is automatically contacted in case of emergency situations.

The students decided to design within the limits of a portable suitcase a service flat to scale. A service flat is quite common in Belgium and designates living areas for elderly people, in which they can live independently but still rely on nearby medical or other assistance.

The suitcase is designed in such a way

that the lid shows the ground plan of the service flat, where the inside is fitted with the KNX devices under a plexiglas cover. The service flat to scale consists of a number of areas, in which the following functions will be realized:

Generally:

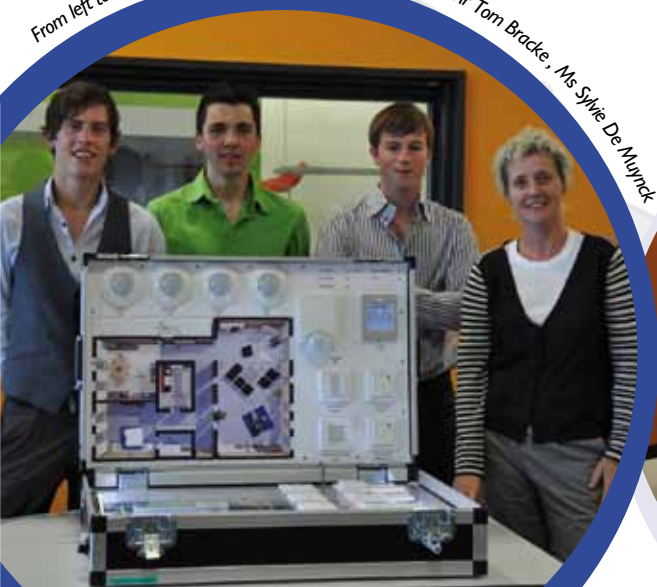
- all rooms will be surveilled with a movement detector not only to activate or deactivate lighting but also to be able to notice long durations of inactivity, with a direct link to a call center.
- The entire flat is properly ventilated 24 hours a day at minimum ventilation speed. In case of activities like cooking the speed is automatically increased.
- For heating, the flat is divided up into two zones controlled by means of thermostats that are simple to operate.
- An all off function is realized by means of a card reader at the entrance.
- In the kitchen, a function ensures that when turning on a cooking plate, the hood is automatically turned on as well as an automatic deactivation of

any cooking plate after a set time after it was turned on. The kitchen will also foresee switchable socket outlets for kettle and/or coffee percolator.

- The bathroom as well as the bedroom are equipped with a pull cord light switch as well as a panic button for emergency situations. In that case, the external lighting will start flashing. The bedroom is moreover equipped with automatically operated blinds.
- In the hallway, the lighting is set to orientation light during the night to easily find the way to the bathroom.

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From left to right Mr Tim De Clercq, Mr Dimitri Welvaert, Mr Tom Bracke, Ms Sylvie De Muynck



portable suitcase



YOUNG GENERATION



Bergische Uni Wuppertal
Wuppertal, Germany



KNX Building System Technology in Competition

The team from the University of Wuppertal took part in the Solar Decathlon Europe in Madrid as one of 20 student groups. The teams competed with each other in ten different categories – including architecture, thermal comfort, marketability and sustainability – with the design and implementation of an energy plus house. The Wuppertal students concentrated their efforts on a building that indicates a positive energy balance over the entire year; not only in Madrid, but also in other European locations. Extensive simulation studies were carried out for Wuppertal and Copenhagen. They prove that the building concept also functions under local climatic conditions.

Together with their industry partner Gira Giersiepen GmbH & Co. KG, the team from the University of Wuppertal developed a building automation system based on the KNX standard. In addition to the control of individual

components such as the shading or night cooling system, a comprehensive smart metering system was the central focus at the planning stage. The current energy consumption and gains were continually displayed through a visually appealing but simple visualization tool in order to influence user behavior and achieve an energy-optimized operational mode for the building.

The User can Engage

A night cooling system consisting of two opaque ventilation flaps in the north wall and two windows in the top section of the south wall is used for passive building cooling. A natural air flow through the house is thereby guaranteed. Both ventilation flaps and both windows are fitted with chain drives which can be controlled with blind actuators. The user can intervene in the control via the touch panel but automatic operation is also possible

based on the room temperature or external temperature. The windows and/or ventilation flaps can be automatically raised once a certain cooling potential is achieved.

A compact ventilation device is used for active ventilation, heating, cooling and water heating and is operated independently of the building automation system. For the purposes of the competition, it was extended with an indirect, adiabatic humidifier. This consists of three high-pressure nozzles which are positioned in the foul-air duct to moisten the extracted air immediately in front of the heat exchanger. The pump for the humidifier is controlled via a KNX switch actuator. The measurement of the relative humidity as well as the temperature of the extracted air and ambient air is carried out in turn via sensors with 0-10 V signals. Using control algorithms to regulate the pump, it can be checked whether there is a cooling requirement and whether the ambient air is dry enough to make



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adiabatic humidification advisable.

LED for the lighting

The lighting in the house has also been completely integrated into the KNX system. The entire lighting system is based on LED technology. An illuminated ceiling with 36 elements is used indoors for illumination and can be controlled individually by two KNX DALI gateways. Additional spotlights are installed at the work station, in the kitchen and bathroom as well as above the dining room table. The external lighting is carried out via KNX switch contacts.

In addition to the control system, a smart metering system based on the KNX system was implemented in the energy plus house submitted by the University of Wuppertal, since the recording and visualization of consumption data is becoming increasingly of interest as part of the energy-optimized operation of buildings. The Gira HomeServer is used to record

and visualize the data. Ten electricity meters are used in total which measure both the consumption of individual circuits as well as the power production of the solar power system. The user can thus view the current power consumption of individual components – such as lighting or heating/ventilation/air conditioning – and analyze long-term consumption data such as day, week and month values. The additional display of power production trains the user to only operate certain devices in the event of a high power gain so that he can be increasingly independent of the power grid.

In addition to the electricity meters, three heat and cooling meters as well as a water meter were incorporated. The range of meters with KNX capability is however still very limited. Special requirements such as the measurement of heat and cold as well as water/glycol mixtures were the reason for using devices with

the M bus protocol. A corresponding M bus KNX gateway translates the M bus protocols and the data is then recorded and visualized by the Gira HomeServer. The user can thus monitor the heat gain of the solar thermal system as well as the heat withdrawal caused by warm water. In addition, a combined heat and cooling meter was used for the underfloor heating/cooling which measures the appropriate heat or cooling consumption.

After the competition, the energy plus house was installed in Wuppertal again for further research. The installation of the extensive monitoring system enables the technical data and simulation results to be monitored during actual operation and in everyday life.



YOUNG GENERATION



Freiherr-vom-Stein-Schule
Neumünster, Germany



KNX in schools – Pedagogic Effect

We clearly use less electricity per lesson."

"That may be the case but optimum lighting for learning is also important to us."

"You have it quite cold in the classroom most of the time."

"We feel comfortable and yet save on the heating."

This is what a discussion about energy efficiency could sound like in the Freiherr-vom-Stein school in Neumünster. The KNX installation enables the energy consumption of individual functions in the classrooms to be observed and documented in detail. Energy competitions can be implemented as part of a physics project. It is not only a case of practicing the conscious use of energy.

Conscious use of energy

KNX therefore has a unique pedagogic task in the Freiherr-vom-Stein school in addition to building automation. In this newly renovated, four-form entry secondary school, KNX controls the lighting system, sun protection, ventilation and the room temperature fully automatically based on the electronic timetable. Manual operation of the functions in the classrooms meets the individual requirements of pupils and teachers. The fact that energy consumption in individual classrooms can be observed and evaluated can be traced back to an idea formulated by the system integrator. The Neumünster engineering office Beyer started with the fact that nowadays energy is continually available everywhere and that people are largely unaware of their personal energy consumption. When CO₂ emissions are reported in the media, a normal person can hardly imagine the amount of energy involved and what energy his lighting, heating or other household devices use.

Calculating CO₂ emissions

With KNX, it is easy to measure energy consumption and make it available via the bus. Consumption data can be represented via a visualization display, trends can be displayed and conversions to the corresponding CO₂ emission are carried out.

In a school in which building automation is carried out via KNX, it would seem opportune to use the school's energy consumption as illustrative teaching material. The teachers and the school administration were immediately delighted with the idea, which the system integrator demonstrated to them using a model installation. The energy consumption and resulting CO₂ emissions can be calculated based on the electricity consumption and by monitoring the percentage of valve opening. No costly additional equipment is required. Switch actuators with current measurement and intelligent visualization are standard in a KNX installation.

The endorsement was not long in coming. In the spring of 2011, the school was finally able to move into its renovated classrooms. The energy consumption of individual classrooms and their CO₂



Picture 1



Picture 2



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emissions are therefore now available just in time for the new school year.

Energy saving as subject matter

The physics teachers are particularly happy about this technology, which gives pupils a vivid picture of the intellectual world of energy saving. The new electronic boards on which the KNX visualization can be called up are the ideal complement. So-called energy weeks are therefore planned for the new school year. In the first place, it has to do with theory: electrical power and artificial light, sun protection using daylight, heat energy and room temperature, sunlight as solar gain in the winter and cooling shade compared to summer heat. This complex topic should awaken attention for energy problems in the face of climate change and achieve more sensitivity for energy consumption in buildings – not only for lessons but also in daily life.

Experience through competition

The topic of energy and buildings also

lends itself for project work in science lessons. This deals with methods of energy saving which the project engineers can develop and represent themselves using the transparent KNX installation. The opportunity presented itself, for example, for two classes to compete against each other in an energy-saving contest. Automatic functions are decommissioned which then have to be controlled manually as efficiently as possible. Errors then quickly become apparent if the energy consumption is too high or if the room conditions are unbearable. Differences call for further thinking. The results over weeks and months are presented, evaluated and discussed on the electronic boards in the physics lab. Whether there will be winners and losers as in a football match or whether a sense of well-being and an optimum learning atmosphere sets the necessary energy usage at a healthy ratio, is the concern of the pupils who are taking part. The teachers will therefore not intervene in the project work so that energy awareness results from the pupil's own experiences.

Picture 1

In the Freiherr-vom-Stein school, KNX not only controls the building technology but also raises awareness of the school's energy consumption with consumption data.

Picture 2

Optimum light for teaching with the most efficient use of energy possible – the pupils are in control and learn to use energy and the resulting emissions within the framework of an energy project.

Picture 3

The electronic boards were used by the school administration Hubert (left) and the system integrator Dirk Beyer (right) to implement the energy-saving concept. The consumption data of the KNX visualization can thus be presented graphically in the lesson.

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Picture 3



Picture 3



KNX ETS4 eLearning

The click to success



Building automation with KNX has a great future – it is a business opportunity not only for professionals such as system integrators but also for newcomers. The newly developed ETS4 eLearning tool from KNX can signify the first step along the path to success. Let's call him Knux, the shrewd installer who wants to make more of his career. He dreams of programming a house full of technical functions for discerning customers.

However many of his colleagues are probably wondering how you get into this promising KNX world.

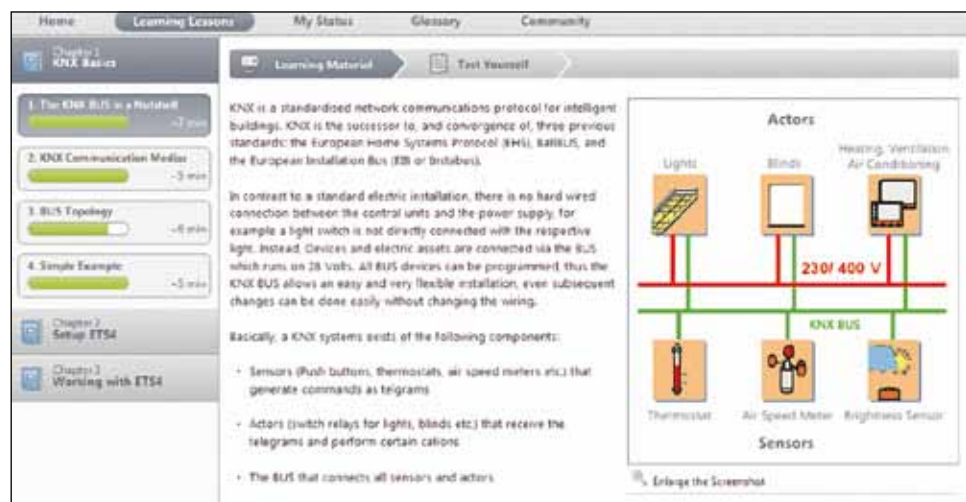
Knux has taken the first step by discovering the new ETS4 eLearning tool in the online shop from www.knx.org.

Newcomers welcome

With the introduction of the new Engineering Tool Software ETS4, several features for creating KNX projects were improved. The tool for home and building system technology should also motivate newcomers to jump on the bandwagon. A great deal of effort has therefore been invested in producing an appealing interface design and clear menu structure for ETS4. Compared to ETS3, more than 25 new functions have been integrated which makes the project design easily understandable and therefore simpler. Experienced system integrators profit from ETS4 as they can configure their



EITT (left screen After registering in the KNX online shop, you can download eLearning free of charge) and ETS (right) are ready for testing



The first lesson gives you basic knowledge about KNX

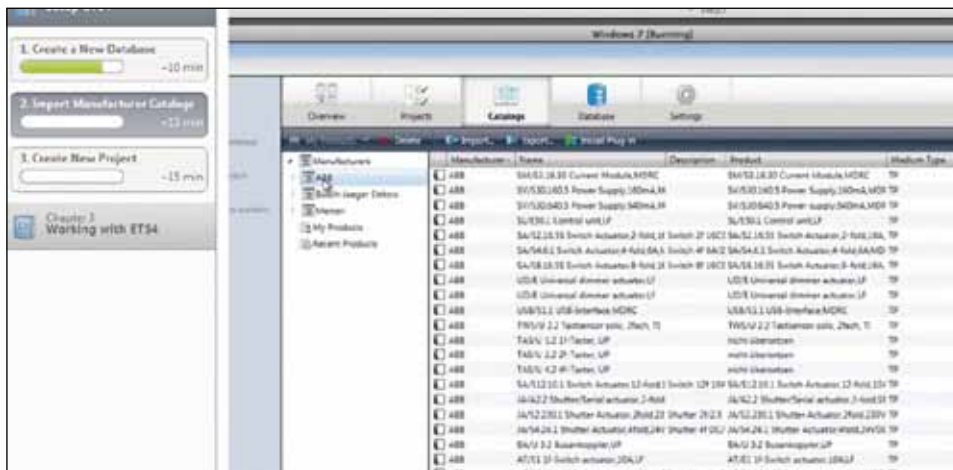
projects quicker, more reliably and with sustained success using the new tool.

eLearning is fun

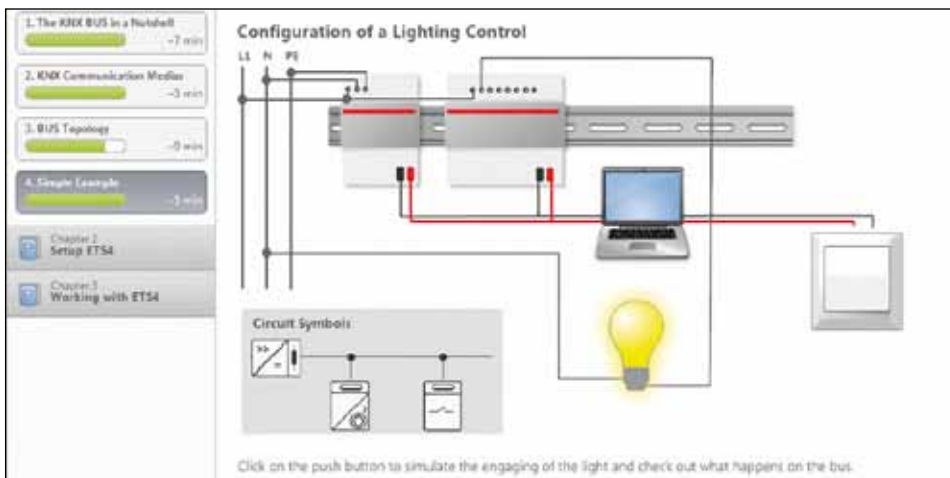
No dry theory here! "It's really relaxing" says Knux as he works his way through the basic knowledge of bus technology. He learns that the bus and power supply systems

are separated, actuators and sensors can communicate via different bus media, how a simple lighting circuit is configured etc. "Correct", says the self-test page after answering the test questions and Knux thinks "This is really easy to understand". But now he needs to keep his ears and eyes open: the

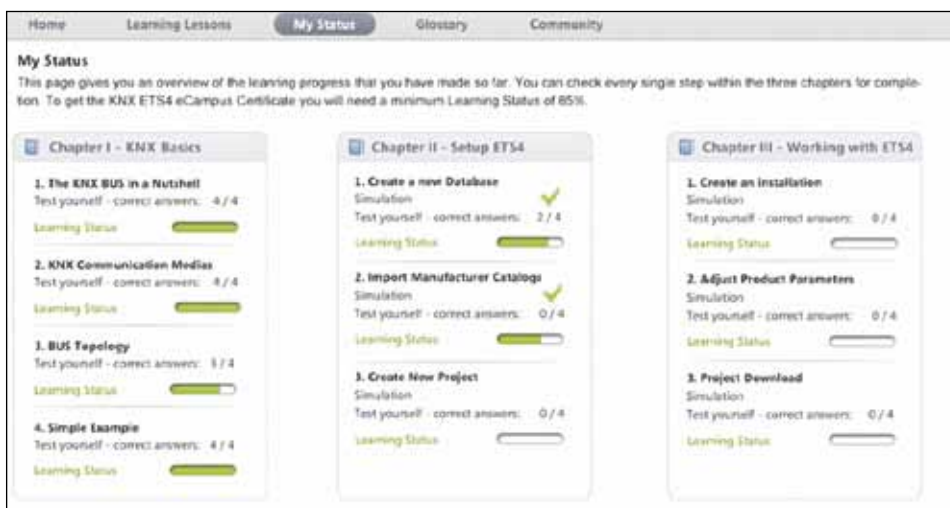
basic principles of the tool software are explained using the spoken word and with the mouse pointer on the ETS4 interface. Starting ETS4 is very easy as is the first step to creating a database—simulated exercises help you to deepen your knowledge. Finally the software of the KNX devices must be loaded. "Which



Interactive learning with ETS4, here showing device selection



Simulation of the physical structure and function of a KNX lighting control system



Remain motivated by testing yourself on your learning progress next image: Knx programming at the PC

software from where?" The exercise confuses Knx so he goes back to the theory again. That is the beauty of KNX ETS4 eLearning: you can work through step by step, test your knowledge after each lesson,

repeat a step if you fail and delight in your learning progress. Knx is now eager and impatient to carry out the next steps which involve simulated project design with ETS4.

Graduating with a certificate

Only a few, simple tasks lead to a sense of achievement: opening a new project, selecting KNX devices, inserting them in the building struc-

ture and linking functions via group addresses. This will appear familiar to Knx as the sequence of operations corresponds in principle to those of conventional device installation and wiring. He will however quickly recognize how flexible the programmable bus technology is for versatile applications. Even unusual customer requirements can thus be fulfilled. But first he needs to learn about the parameterization of the device functions – the so-called finishing touches – so that the individual devices can grow into an integrated automation system. Finally the project software is loaded into the networked hardware and the system is put into operation – the project is then complete.

Those who achieve sufficient points during the self-test even receive a certificate as a printout – evidence for the boss, for customers and of course further professional KNX training.

Free of charge in the online shop

KNX ETS4 eLearning is the systematic implementation of the flyer "ETS4 for beginners". The training is primarily directed at newcomers who wish to gain an insight into building automation with KNX without having to spend time or money first. KNX ETS4 eLearning is based on an object-oriented learning management system which has been tried and tested all over the world. The two-level learning concept, consisting of the transfer of knowledge about ETS4 and practical online simulation exercises, was developed in consultation with leading KNX training facilities. From October 2011, it will be available in "English" and "German" with other languages also at a later stage. KNX ETS4 eLearning can be obtained free of charge after entering the registration data in the KNX online shop (www.knx.org).



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