An evening with KNX
Welcome & Acknowledgement

Special guest Mr. Heinz Lux CEO of the KNX Association

Directors of the KNX National Group of Australia

Acknowledge support provided by the KNX National Group to bring this event to life.
Our presentation tonight

What is KNX?
KNX Building Philosophy
System Description Overview
What does KNX offer?
Case Studies
  Taronga Zoo
  Surf Coast Shire Civic Building
  161 Castlereagh St
Guest Speech – KNX Cities
Lucky door prize draw
mySmartCTI offers complete solutions combining various systems and involving specialty companies to provide a fully unified end product.

- Established in 2001
- 100% Australian owned
- Around 50 staff
- Offices in Sydney, Melbourne, Brisbane, Canberra and Perth
- Supply automation and energy management solutions, products and services
What is KNX?

A truly open system for control in homes & commercial buildings

Reliable technology for more than 20 years

More than 10 million installed nodes in tens of thousands of installations

Supported by more than 300 members of the KNX Association

“Programming” by the Engineering Tool Software ETS
The worldwide STANDARD for home and building control

KNX members

300 manufacturers from 34 countries

www.knx.org
KNX Building Philosophy

KNX is the world’s only open Standard for building automation
ISO/IEC 14543-2

KNX is controlled by the KNX Association in Brussels which ensures the technology is independent of all manufacturers.

KNX devices from different manufacturers are checked for compliance with the standard, registered and certified by the KNX Association.

Compliant devices will display the registered KNX Logo.
System Description Overview

A bus cable a twisted pair of wires (2x)2x0.8 is used. Ethernet, RF and power line are also supported.

The bus cable may be installed in parallel & close to power cables

Open bus topology, no end-of-line resistors, length of a bus line including spurs is a maximum of 1,000 m

Line, tree or star structures are supported
System Description Overview

Approx 15,000 devices on one KNX system

Each device gets an individual (physical) address, by which it can be parameterized and polled

The functional assignment between each single device (object) is achieved by the assignment of group addresses

A device consists of a BUS Coupler Unit (BCU) and a BUS Device (BD) but could include a complete room controller or DALI interface
What does KNX offer?
KNX Building Automation

What does KNX offer?

Integrated Switching and GUVs

One of the key strengths of KNX is that multiple functions may be incorporated into one switch. This removes the ugly and unprofessional mess that is switch boxes where multiple switches from many different vendors in many different styles are combined together in one box. With many different switch manufacturers providing many different styles, finishes and functions not only is the building fully converged it is also extremely attractive.

Lighting Control

KNX may be used in a number of ways to control lighting:
- Directly over the KNX network with KNX switches and relays
- Via gateways – DALI, LON, OSI, 1-10V
- Via IP networks

Task lighting may be via KNX switches or touch screens, standard switches using binary outputs or smart switching via IP.

In all cases feedback and status is available over the KNX network. Controls and relays may be centrally mounted or field located. KNX networks in different areas or on different floors may be connected via KNX line couplers or KNX/IP gateways.

Facade Automation

KNX is ideally suited to facade automation. Weather stations and sensors detect ambient conditions including light levels, radiation levels, wind speed and direction, external and internal temperatures and precipitation. Internal and external blinds and windows can be addressed to move or individually depending on requirements.

An automated facade using KNX is ideally suited to controlling the amount of glass and solar radiation entering the building. A key benefit of KNX is that the lighting control and facade control can both sit on the same KNX network to allow operating synergies. External sensors automatically position the blinds and windows to meet the immediate ambient conditions. Harnessing the power of presence detection, internal light and temperature sensors a combined system will then keep internal lighting and temperature within defined parameters. Occupants can override their blinds and lighting to suit their requirements only whilst they’re occupying the space. Once they depart the system will revert back to automatic control to ensure optimum energy efficiency is maintained.

Visualisation and Head-End Software

There are many solutions for providing software packages to visualise and control KNX solutions, ranging from a manufacturer solution based through to a whole project based. Specialist providers offer totally customisable KNX visualisation software enabling control via PC, tablets and/or smart phones. Where this preference is to see seating head-end packages links via OPC-Server are also possible.

mySmartCTI™

Sydney | Melbourne | Brisbane | Canberra | Perth

www.mySmartCTI.com.au
**, KNX Building Automation**

**What does KNX offer?**

**Smart Metering**

KNX may be used for direct energy, water and gas metering as these KNX meters are available. Alternatively a KNX Gateway may be used more commonly with meters that use Modbus. The KNX Gateway shows access to both Modbus and KNX telegrams. Further metering data may be transferred from IOM to IP and onwards to user via information panels such as enGauge.

Tank probes and other similar devices are also available in IOM. As well as measuring the volume of a tank outputs may be triggered when exceeding or dropping below specified levels.

**Audio-Visual and 3rd Party Devices**

Many Audio-Visual control suppliers such as AVX and Crestron offer proven KNX interfaces in order to control audio-visual devices in boardrooms and other installations. Many 3rd Party devices can also interface to KNX such as white goods, HEPES, fans etc., air conditioning, sound systems, etc.

**HVAC**

As HVAC is often considered the backbone of a Building Management System it is imperative that KNX can be used for HVAC control. Many manufacturers of HVAC systems offer KNX control modules including most of the major air conditioning systems providers in Australia. KNX also offers seamless integration with AEC and other protocols via KNX or OPC gateways.

Occupants have control over HVAC via a tablet and KNX thermostats and other KNX multi-Junction switches.

**KNX enGauge**

The mySmart enGauge panel is a friendly and intuitive system designed for use in foyers, lobbies, shopping centres or any public space to display real-time and historical data on building energy and environmental performance. The display uses the building's energy meters and other devices to gather data on building environmental performance. Consumption data is presented in an easy to read graphical snapshot on a flat screen panel accompanied by comments to explain the graphs displayed.

mySmart enGauge can be easily linked to a KNX solution through the use of a KNX enGauge Gateway.
A KNX highlights – Multi-function switches

One touch control
  Lighting
  Dimming
  Curtains
  Air Conditioning
  Security
  And more….

Scenes to suit your mood
  Presentation
  Projector
  All On
  All Off
mySmartCTI KNX Reference Projects

Taronga Zoo - Sydney
Surf Coast Civic Building - Victoria
161 Castlereagh St - Sydney
Villawood Immigration Centre - Sydney
UTS Great Hall – Sydney
Aurecon C7 – Melbourne
CSIRO Super Computer Centre – Perth
CSIRO Canberra Deep Space Communications Complex, Tidbinbilla
Taronga Zoo

Challenge of managing numerous buildings, displays and infrastructure across a 20Ha site

Previously installed legacy system is being progressively upgraded to KNX

Gives vastly improved information flow on current status, energy usage and any power outages
Taronga Zoo

KNX controls the following at Taronga Zoo

- Lighting – pathways, caparks,
- Metering – electrical substations
- Function Centre – lighting, HVAC
- Remote access and visualisation

Future plans – water metering
Surf Coast Shire Civic Building

Design needed to meet the expectations of the local community in providing a cost effective and resource efficient building.

Project Awarded
- 5 Star Green Star – Office Design V3
- International Best Project – 2012 KNX Awards
- NECA Excellence Award – Energy Efficiency and Environment
Surf Coast Shire Civic Building

Fully converged KNX building

- Office lighting
- Sports field lighting
- Air-Conditioning
- Renewable Energy
  - Photovoltaic System
  - Wind Turbine System
- Energy Monitoring
- Energy Display and Tracking
161 Castlereagh St

Will be known as ANZ Tower

- 6 Star Green-Star – Office Design V2
- 44 levels
- Tenants
- ANZ Bank
  - Herbert Smith Freehills
  - Boston Consulting Group
161 Castlereagh St

Largest KNX Project in Southern Hemisphere

- Base Building lighting
- Tenancy lighting
- Tenancy façade control
- AV control – AMX
- BMS Interface - BACnet
Guest Speaker - Mr. Heinz Lux

CEO and Spokesman for the KNX Association
KNX
The worldwide STANDARD for home and building control

Heinz Lux
CEO
KNX Association International

www.knx.org
KNX is the Standard

- **CENELEC**
  **EN 50090** – the only European Standard for Home and Building Electronic Systems (HBES) based on KNX.

- **CEN**
  **EN 13321-1** – the European Standard for Building Automation based on KNX.

- **ISO/IEC**
  **ISO/IEC 14543-3** – the World’s only Standard for Home Electronic Systems (HES) based on KNX.

- **GB/T**
  **GB/T 20965** – Chinese Standard for Home and Building Control based on KNX

- **US Standard (ANSI/ASHRAE 135)**

**KNX: The worldwide STANDARD for home and building control!**
Advantages of KNX

www.knx.org
KNX – Advantage No. 1

KNX is a standard here to stay!

- **CENELEC**
  2003: KNX became **EN50090**

- **CEN**
  2005: KNX became **EN13321-1/2**

- **ISO/IEC**
  2006: KNX became **ISO/IEC14543-3**

- **SAC (P.R. China)**
  2013: KNX became **GB/T 20965**

- **ANSI/ASHRAE**
  KNX referenced in **US ANSI/ASHRAE** standard **135**
KNX – Advantage No. 2

Guaranteed Interoperability through neutral certification

1. KNX is the only home and building control standard running global certification schemes for
   A. Products
   B. Training Centers
   C. Persons

2. Product compliance is checked at neutral third party test laboratories

   KNX Logo guarantees interoperability between products of different manufacturers and applications
KNX – Advantage No. 3

KNX = High Product Quality

1. KNX Association requires high level production and quality control during all stages of the product’s life

2. All manufacturers have to show compliance to ISO 9001 = prerequisite for product certification
KNX – Advantage No. 4

One Tool – the Engineering Tool Software ETS™!

1. One PC software tool for
   A. Design
   B. Configuration
   C. Diagnostics
   of KNX all certified products

2. Tool is manufacturer, devices and application independent – integrator can combine products of different manufacturers and applications in one installation

3. Tool is extendable with customized Apps
KNX – Advantage No. 5

Fit for use in all applications in home and building control!
KNX – Advantage No. 6

Fit for use in all kinds of buildings!

1. New or Existing Buildings

2. One family houses or large size buildings

3. Easy extendible/adaptable to new needs
KNX – Advantage No. 7

Support for different transmission media

1. *Twisted Pair*

2. *Power Line*

3. *Radio Frequency*

4. *Ethernet/WIFI*
KNX – Advantage No. 8

Support for different configuration Modes

1. **System Mode**
   A. Configuration with PC (ETS)
   B. Prior basic course training recommended
   C. Any size of installation

2. **Easy Mode**
   A. Configuration without PC
   B. No prior training necessary
   C. Small or medium size installations
KNX – Advantage No. 9

Easy coupling to other systems

1. KNX members offer large variety of gateways to couple to other bus/automation systems

2. Examples

   A. Mapping to BACnet
   B. Interfacing with DALI
KNX – Advantage No. 10

KNX is independent from any hard- or software technology

1. KNX manufacturers can develop own protocol solution
   1. From scratch
   2. On basis of existing certified system components from other KNX members

2. KNX is completely FREE of additional royalty fees: No IPR royalties to be paid for KNX standard features used in KNX certified products to other KNX members
315 Members in 34 countries
KNX Members in 2009

175 KNX Members in 18 countries
KNX Members in 2012

297 KNX Members in 33 countries
More than 7000 certified KNX Devices
256 Training Centres in 50 countries
Training Centres in 2009

136 KNX Training Centres in 27 countries
Training Centres in 2012

237 KNX Training Centres in 46 countries
37330 Partners in 121 countries
KNX Partners in 2009

18804 KNX Partners in 98 countries
KNX Partners in 2012

Bosnia and Herzegovina  Macedonia  Kosovo

Dominican Rep.  Suriname  Mauritania

USA  Myanmar

Ecuador  Namibia

Peru  Nigeria

Bolivia  Swaziland

Paraguay  Uruguay

36414 KNX Partners in 119 countries
7 Associated Partners
2009: KNX at light and building
2012: 100 KNX fairs around the world
KNX Facts & Figures June 2013

- 315 KNX Members in 34 countries
- 7000 certified product groups
- 37330 KNX Partners in 121 countries
- 256 Training Centers in 50 countries
- 95 Scientific Partners in 27 countries
- 10 Userclubs in 9 countries
- 7 Associated partners
- 36 National Groups
- ETS sold in more than 120 countries
KNX city

New business opportunities

www.knx.org
From the KNX building to the KNX city

- Buildings are responsible worldwide for...
  - ...40% of the consumption of final energy
  - ...21% of the production of greenhouse gases
  - ...an increasing demand for energy
Energy Efficiency in the KNX buildings

Energy Savings with KNX in the buildings:

- 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

• Energy efficiency in Guarda Polytechnic Institute
• The largest building in the Middle East
• A family home in low energy standard in Innsbruck (Austria)
• Improved energy balance in insurance company (Prague)
• A new bioclimatic office building in Huesca (Spain)
• Electricity for the City of Salzburg (Austria)
• Nerocubo Hotel in Italy

Energy Savings with KNX in the buildings:

• 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
From the KNX building to the KNX city

- Cities are worldwide responsible for…
  - …two third of the total energy consumption
  - … 60% of the total water consumption
  - … 70% of the production of greenhouse gases

- More than 50% of the world population live already today in metropolitan areas
  - ➔ Until 2050 it will be up to 70% of the world population
KNX has its focus in the building…

… but considers Smart Grid and city issues

- A “Single solution” doesn’t meet city sustainability objectives
- Smart cities require buildings that interact with the city
- Different fields need to interact. Examples:
  - “Mobility” affects “buildings”, e.g. charging of electric vehicles
  - „Energy generation“ affects buildings, e.g. decentralized generation on roofs of “buildings”.
  - The building affects the “City”, e.g. by feeding in surplus energy into the grid.

⇒ KNX city sets a new focus with existing KNX technologies in the buildings
KNX city distributed facilities

- KNX offers communication by twisted pair, IP and radio frequency
- Buildings can be connected to each other over distances by IP as if they were one building
  - Distributed facilities
  - Energy management over distances
  - Balancing of generation and consumption of different buildings.
From the building to the KNX city

KNX city offers solutions in the interaction of buildings, mobility, infrastructure and energy generation

Building + Mobility + Infrastructure + Energy Generation = KNX city
KNX city
KNX city - China