Energy Efficiency with KNX – Focus on Lighting Saving

Hager

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Agenda

Part 1 – About KNX…

01 | KNX Overview 05
02 | Why KNX 15
03 | Some Use Cases 20
04 | Energy Efficiency 26

Part 2 – IoT Controller Presentation

01 | General Overview 32
02 | Use Cases 36
03 | Technical Information 44
04 | Installation Process 46
05 | Benefits & USPs 55
Part 1
About KNX
01 KNX Overview
What is KNX?
KNX
The Strength of a Standard

What is KNX?
KNX is the worldwide standard for home and building control.

+7,000 products
+418 Manufacturers in 41 countries
+70% of the home automation market in Europe
KNX Overview – What is KNX?

KNX Structure
KNX Overview – What is KNX?

History of KNX

1990
Foundation under the name “EIB Association”

1999
Merger with two other associations (Batibus and EHS)

2006

++
KNX Overview – What is KNX?
A world-wide Standard

CENELEC
2003: Approval of KNX as EN50090

CEN
2005: Approval of KNX as EN13321-1/2

ISO/IEC
2006: Approval of KNX as ISO/IEC14543-3-1 bis 7

ANSI/ASHRAE
Reference in US ANSI/ASHRAE standard 135
KNX Overview – What is KNX?
High Quality Product

KNX means High Quality Product

KNX Association requires High Level Production and Quality Control during all stages of the product’s life.

All manufacturers have to show compliance to ISO 9001: it is a prerequisite for product certification.
Decentralized control

All individual devices are intelligent in a KNX installation which means a ‘single device’ fault will not affect the entire system.
KNX Overview – What is KNX?
Guaranteed Interoperability through neutral certification

KNX is the only home and building control standard running global certification schemes for:
- Products
- Training centers
- Persons

The product compliance is checked by neutral third party test laboratories.
KNX Overview – What is KNX?
KNX fits for use in all kinds of buildings!

- New or existing buildings
- One family house or large size buildings
- Easy extendible/adaptable to new needs → Futureproof
KNX Overview – What is KNX?
All the layers are standardized

Realisation/Installation of many functions
Standardized configuration
Application software (in the device or as ETS product data)
Application module
Standardized KNX operating systems ("Bus Coupling Units")
Standardized transmission media
# KNX Overview – What is KNX?

All the layers are standardized

<table>
<thead>
<tr>
<th>Medium</th>
<th>Transmission via</th>
<th>Preferred areas of application</th>
</tr>
</thead>
</table>
| Twisted Pair   | Dedicated bus cable  | - New installations  
                             - Extensive renovations  
                             - Highest level of transmission reliability |
| Radio Frequency| Radio line           | - When no cables can be installed                                   |
| IP             | Ethernet/WIFI        | - In large installations where a fast backbone is needed  
                             - For communication with mobile devices                          |
02 Why KNX?
Why KNX?
418 KNX manufacturers in 41 countries

KNX Turnover (in M€)

- 85
- 78
- 77
- 76
- 84
- 107
- 147
- 175
- 216
- 247
- 297
- 322
- 378
- 402
- 407

Why KNX?
420 training centers in 67 countries
Why KNX?
70,000 KNX partners in 161 countries

199 in KSA
03 Some Use Cases
Manage comfort & energy in your building
Manage comfort & energy in your building

Lighting

- Changing easily the light ambiance.
- Saving energy by dimming / no unnecessary lighting.
- Central control of all lighting.
Manage comfort & energy in your building
Shutters and Blinds

- Easily changing the atmosphere.
- Saving energy by opening / closing shutters.
- Central control of shutters.
- Automatic weather / day-night control of shutters.
Manage comfort & energy in your building

Heating & A/C

- Easily changing the comfortable feeling.
- Saving energy by efficiency control for heating and A/C.
- Central / automatic control of all rooms for heating and A/C.
Manage comfort & energy in your building

Alarm

+ Integration of burglar alarm.
+ Integration of smoke / CO₂ alarm.
+ Presence / motion detectors.
+ Integration of IP cameras.
Manage comfort & energy in your building
Remote monitoring & control

+ Remote control of your installation.
+ Get alerts on your mobile.
+ Monitor your building with IP cameras.
Choose the atmosphere to make the moments even more beautiful. Manage your comfort with your fingertips, or let KNX do it for you.

+ Enjoy the best lighting level without having to think about it.
+ Do not have to stand up to get your shutters closed.
+ Never mind about a lamp left on in the staircase.
04 Energy Efficiency
Energy efficiency class according EN 15232
Energy-saving potentials
(thermal / electrical)

Class A – Highly energy efficient room automation and interconnected construction packages.

Class B – Higher, optimized stand-alone construction packages, partially connected.

Class C – Standard room automation, reference standard.

Class D – No room automation, not energy efficient.
Energy efficiency
Huge Potential for Energy Savings in Buildings

Consumption of 40% of global's energy
Production of 21% of greenhouse gases

Transportation
28%

Buildings
41%

Industry
31%

Forestry
14%

Industry (electricity)
22%

Buildings (electricity)
13%

Buildings (primary energy-consumption)
8%

Agriculture Waste disposal
14%

Transportation
18%
Energy efficiency
40% of the costs generated during a building’s Useful life are required for energy
Energy efficiency
Hager KNX Solutions make it easy!

**Easy control** to make sure you don’t leave anything on when you’re leaving.

**Easy programming** of heating and cooling.

**Automation to optimise** natural lighting and block the solar radiation.

**Visualizing** your consumption and being aware to control and optimise.
Energy efficiency

How to save energy on lighting - trizones

Tri-zone

With only one movement sensor, you can manage up to 3 lighting zones independently. This can be very useful in classroom-type applications. The same detector controls the ballasts on the corridor side, the ballasts on the window side as well as the lighting of the switchboard. Each of these lights may vary independently depending on the brightness and the presence of occupants in these areas.
Energy efficiency
How to save energy on lighting – several detection channels

Independent management of presence and brightness detection channels

By separating information from brightness and presence, detectors can drive applications that go beyond lighting management. For example, you can change the heating setpoint or control the ventilation speed level depending on the occupancy.
Energy efficiency
How to save energy on lighting – indirect lighting

Taking indirect lighting into account

Natural and artificial lighting sources can be separated to prevent the detectors from being dazzled by other artificial light sources. By subtracting these disturbances, the value of the brightness will be adjusted to the nearest needs.
Energy efficiency
Examples of Energy Savings with KNX in Buildings

Electricity for the City of Salzburg (Austria)

Oundle School, Peterborough (Great Britain)

Improved energy balance in insurance company (Prague)

A new bioclimatic office building in Huesca (Spain)

Nerocubo Hotel in Italy

Energy efficiency in Guarda Polytechnic Institute
Part 2
IoT Controller Presentation
01

IoT Controller
General Overview
IoT Controller
Welcome to the IoT World

About IoT…

“The Internet of Things (‘IoT’) – all-embracing heterogeneous networks of smart devices hyper-connected with each other via the Internet – is on the rise and will become reality within the next five years. The decisive change accompanying the IoT will be its ubiquity: networked devices are everywhere.”

Source: European Commission Report, Jan. 2017
# IoT Controller

## Welcome to the IoT World

**Worldwide IoT Units Installed Base by Category (Millions of Units)** *(Gartner UK, Feb. 2017)*

<table>
<thead>
<tr>
<th>Category</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer</td>
<td>3,963.0</td>
<td>5,244.3</td>
<td>7,036.3</td>
<td>12,863.0</td>
</tr>
<tr>
<td>Business: Cross-Industry</td>
<td>1,102.1</td>
<td>1,501.0</td>
<td>2,132.6</td>
<td>4,381.4</td>
</tr>
<tr>
<td>Business: Vertical-Specific</td>
<td>1,316.6</td>
<td>1,635.4</td>
<td>2,027.7</td>
<td>3,171.0</td>
</tr>
<tr>
<td>Grand Total</td>
<td>6,381.8</td>
<td>8,380.6</td>
<td>11,196.6</td>
<td>20,415.4</td>
</tr>
</tbody>
</table>
IoT Controller
Use cases
IoT Controller
How it works – TJA560
Environment
IoT Controller
How it works – General Presentation

The best choice

The IoT Controller is a gateway between KNX products and third-party connected devices. It is then One simple way to control the whole house.

It allows access to all functionalities of non-KNX products with an IP connection. It can be installed on a new or existing installation and does not require the presence of a domovea server.

You can access the system configuration through a web browser.
IoT Controller

Use Case #1 – Talking with Alexa

Control any KNX device with your voice

New TJA560 can be used with Amazon Echo. This smart device is capable of voice interaction, music playback, making to-do lists, setting alarms, streaming podcasts, playing audiobooks, and providing weather, traffic and other real time information.

Used with Hager IoT Controller, Amazon Echo becomes a real automation hub, and allows end users to control with their voice any device in the house, as well as any command.
IoT Controller

Use Case #2 – Music Everywhere

Control a Sonos loudspeaker from any KNX switch

Sonos is the wireless Home Sound System that allows end users to control what they listen and when through a simple app.

Used with Hager IoT Controller, Sonos adapt itself to the house. Thus, from a KNX switch (automatic or not), end users can control the house equipment (lights, shutters, etc.) and do the following actions at the same time:

- Music On / Off
- Music Play / Pause
- Music Volume
- Next / Previous song or playlist
- Artist title feedback
- Song title feedback
IoT Controller
Use Case #3 – And there was Light

Control a Hue bulb from any KNX switch

Thanks to Philips Hue, it is now possible to choose the colors of the light emitted by the bulbs, and thus to create a customized ambiance according to everyone’s preferences.

Those bulbs can be used with Hager IoT Controller. Thus, from a KNX switch end users can control the house lighting and do the following actions:

• On / Off
• Color
• Luminosity
• Scene
IoT Controller
Use Case #4 – Weather and Air Quality

When weather conditions impact the house

The Netatmo weather station collects information from both inside and outside the house. The indoor module provides vital information, alerting end users when they need to air out the home to bring down its air pollution level. The outdoor module gives real-time weather information like temperature, air quality and humidity rate.

Using Hager TJA560, it is possible to see the Netatmo values in domovea and to use these values to control KNX devices such as…

- The ventilation, according to the air quality.
- The shutters according to the luminosity level.

!hager
IoT Controller
Use Case #5 – IoT Unlimited

As IoT is the future…

Hager TJA560 allows to connect to the popular IFTTT platform and thus to connect KNX with more than 300 IoTs and services such as Google Assistant, Netatmo Welcome, BMW, Android Wear or Tado.
IoT Controller Technical Information
**IoT Controller**

**Technical Specifications**

- **Hager**
  - TJA560
  - Dimension: 6 modules

**KNX power supply**

- KNX bus SELV 30 V =
- 24 V = via power supply SELV Hager TGA200 or TXA114 or via PoE

**Safety extra-low voltage**

- 24 V = via PoE

**Consumption on the bus line**

- 10 mA max - 30 V =
- 200 mA max - 24 V=

**Consumption on the auxiliary power supply**

- 8 mA

**Standard/Standby consumption on the KNX bus**

- 100 mA

**Standard/Standby consumption on the 24 V Ethernet and non-connected USB**

- 5W

**Maximum dissipation (24V output)**

- 50 mA

**Backup duration for the date and time**

- 1 year minimum

**Ethernet network communication**

- 2 x 100/1000 BaseT

**Bus connection**

- 0.6 - 0.8 mm²

**Power supply socket**

- 0.75 - 2.5 mm²

**Ethernet/IP network socket**

- 2 x RJ45

**Operating Temperature**

- 0 °C —> + 45 °C

**Storage Temperature**

- - 20 °C —> + 70 °C

**Footprint**

- 6 x 17.5 mm

**USB2 Interface**

- 2

**Installation method**

- DIN rail

**Operating altitude**

- < 2000 m

**Pollution level**

- 2

**Surge voltage**

- 4 kV

**Protection rating (box) (box under faceplate)**

- IP20
- IP30

**Impact resistance**

- IK04

**Overvoltage category**

- III

**Standards**

- EN 60950-1, EN 50491-3, EN 50491-5-2, IEE 802.3 at, USB 2.0, Handbook KNX 2.1
04 IoT Controller
Benefits and USPs
**IoT Controller**

**Benefits for customers**

01 **Smart House Device:**
In 2016, 85% of European households had access to the internet from home. This share has been gradually increasing since 2007, when only 55% of households had access to the internet*. In other words, Internet is now fully part of customers’ everyday life. IoT, just like Smart Home, is progressively entering their lives too. The IoT Controller is a way to improve their home experience using a communication mean already fully accepted.

02 **Greater Experience:**
With one device only, end-users will be able to control their whole house with their voice. They will be able to customize their home according to their habits, and this home will become more than the place they live. And thanks to a user-friendly app, they will be able to control everything in the simplest possible way.

* Source: Eurostat, 2017
IoT Controller
Benefits for installers

01
Maximum Flexibility:
The IoT controller can be installed in a new or an existing KNX installation. Installers can then easily include this new product in any kind of project.

02
Simplicity First:
The installation of Hager TJA560 is easy: No software required, as only a webservice is needed for the system configuration. And domovea is not mandatory to ensure the efficient utilization of the server.

03
A well positioned solution:
Hager is the first manufacturer to provide an all-in-one solution which is compatible with KNX and linked to the IFTTT world. Indeed, up to 200 IoT can be used at the same time being connected to one server, including Amazon Echo which can now interact with KNX devices.
Thank you for your attention!

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