



KNX
The worldwide STANDARD
for
home and building control

KNX Association International

www.knx.org

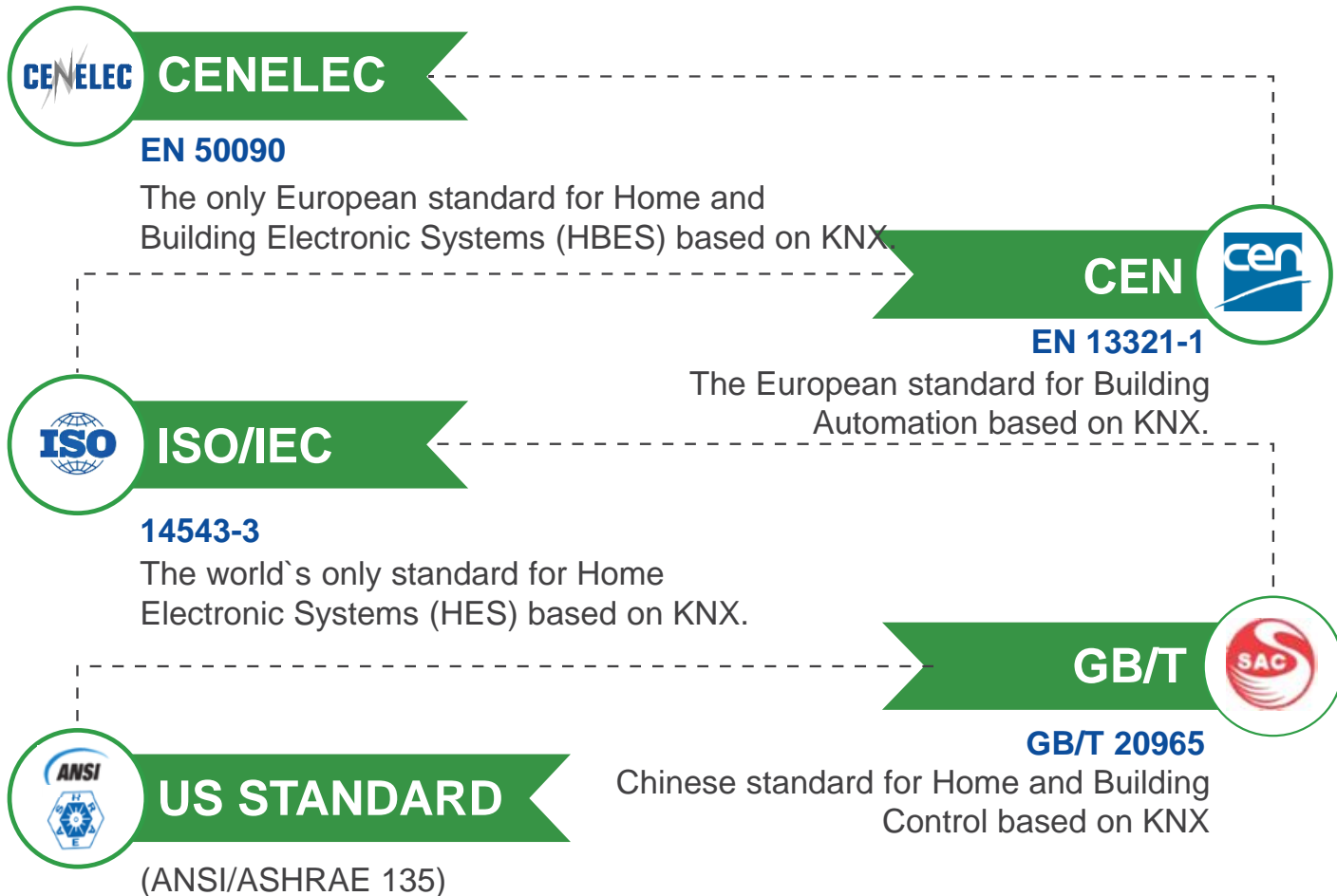


KNX status quo

January 2017

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KNX is the standard



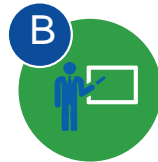
KNX is interoperable (1)

Guaranteed interoperability through neutral certification

- KNX is the only home and building control standard running global certification schemes for



Products



Training centres



Persons

- Product compliance is checked at neutral third party test laboratories



KNX logo guarantees interoperability between products of different manufacturers and applications

KNX is interoperable (2)

Guaranteed interoperability through neutral certification

- One PC software tool for



Design



Configuration



Diagnostics

of all KNX certified products

- Tool is independent of manufacturers, devices and applications – integrator can combine products of different manufacturers and applications in one installation



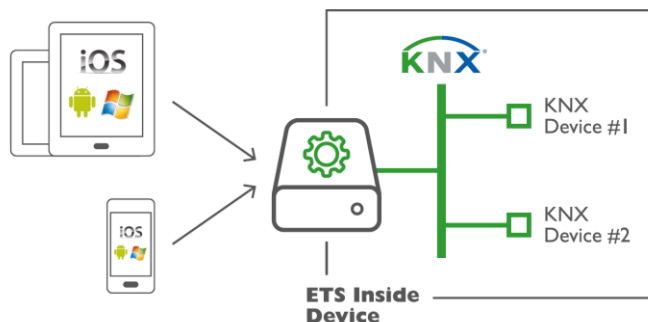
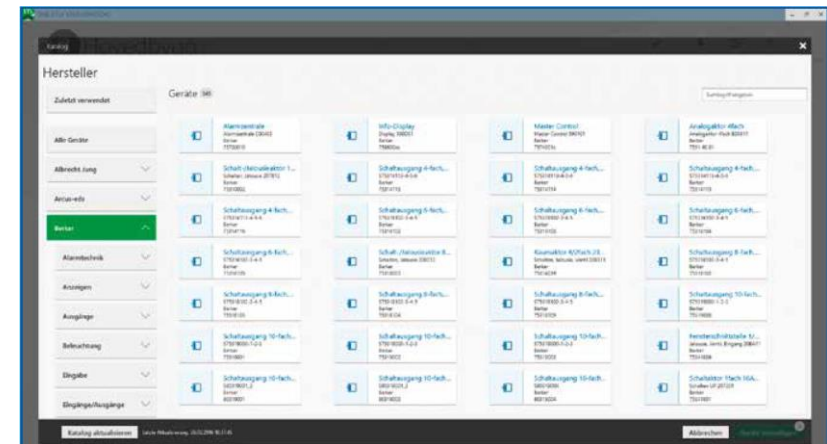
- Tool is extendable with customised apps



KNX is smart home

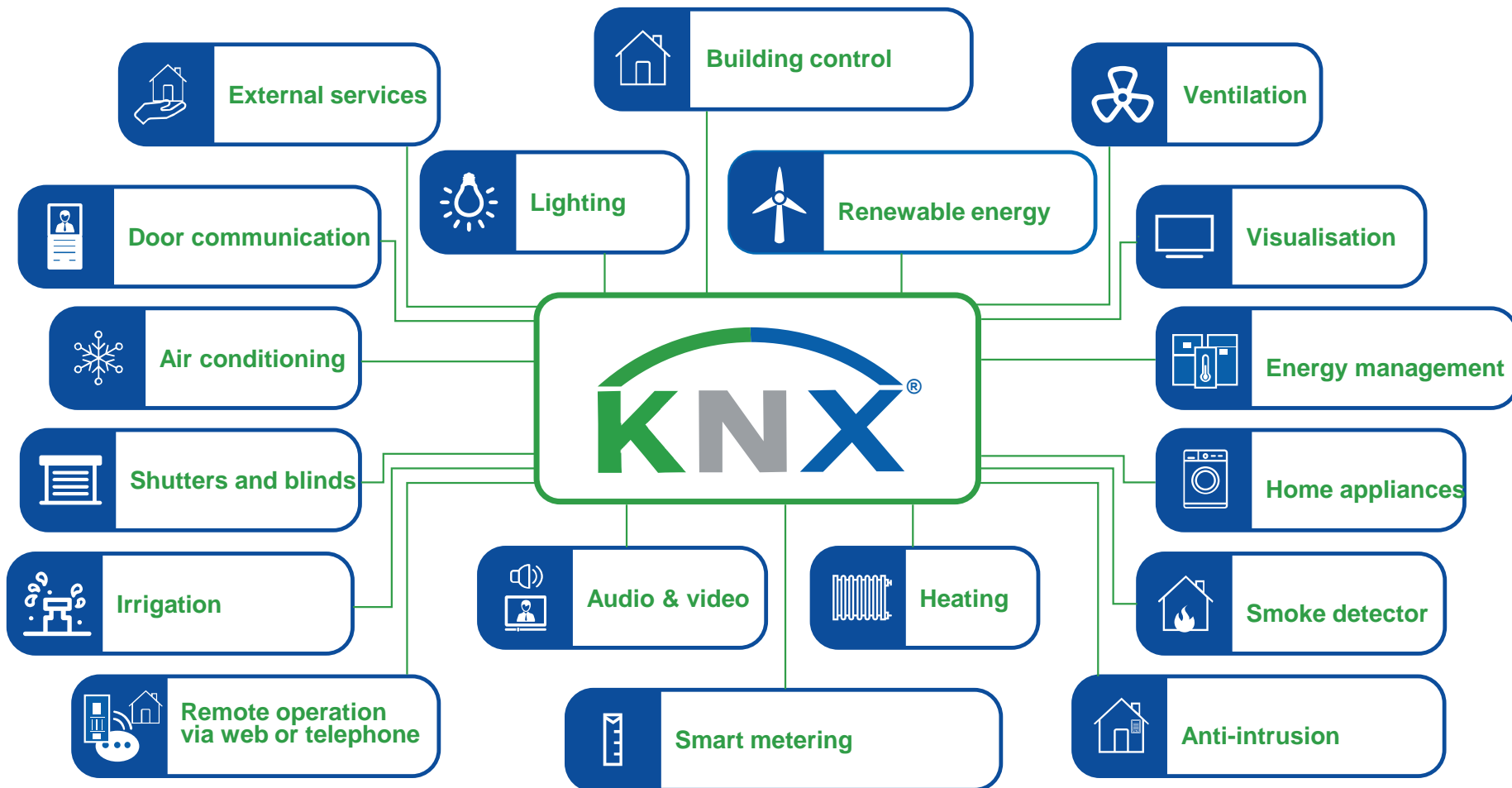
ETS Inside is...

- **Smart** - Finger tap instead of mouse click
- **Simple** – One tool for installers and end users
- **Safe** - No unauthorised access



- 1 ETS Inside is part of the KNX system. Operation and ETS data are decoupled.
- 2 The easily comprehensible user interface even runs on tablets and smartphones.

KNX is fit for use in ALL applications



KNX is fit for use in all kinds of buildings



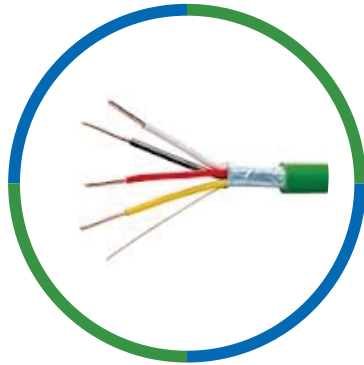
- New or existing buildings
- Single-family houses or large size buildings
- Easy extendable/adaptable to new requirements



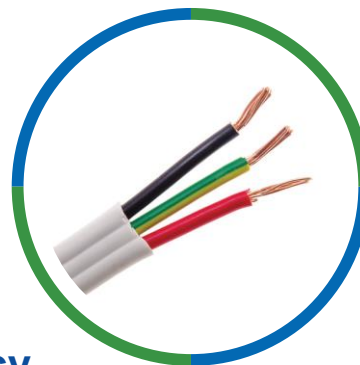
KNX supports the most important transmission media



Twisted Pair



Power Line



Radio Frequency



Ethernet/WIFI



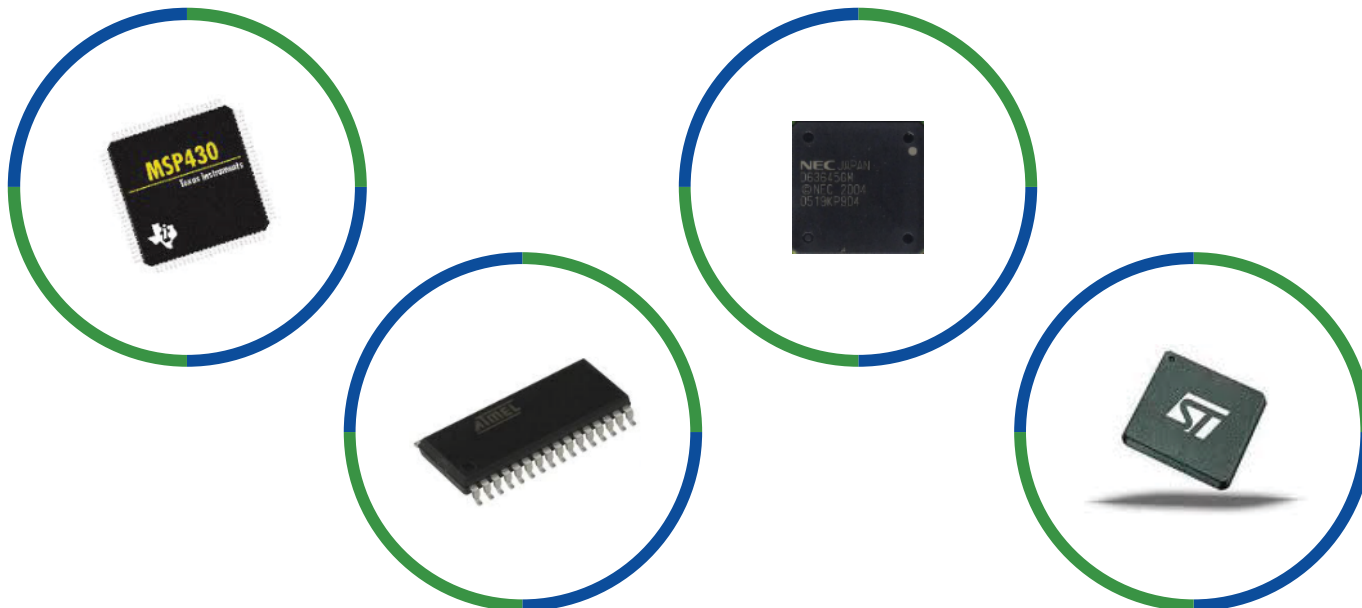
KNX is independent of any hardware or software technology



- KNX manufacturers can develop their own protocol solution

- 1 From scratch
- 2 On the basis of existing certified system components from other KNX members

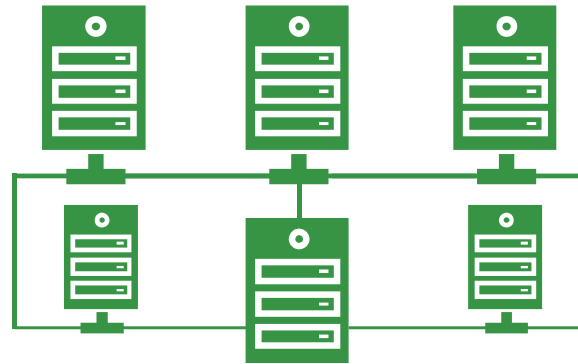
- KNX is completely FREE of additional royalty fees: No IPR royalties to be paid for KNX standard features used in KNX certified products to other KNX members



KNX is easy to couple with other systems



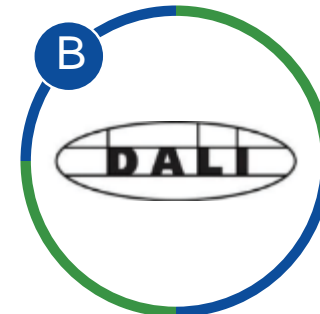
- KNX members offer large variety of gateways to couple to other systems



- Examples



Mapping to BACnet



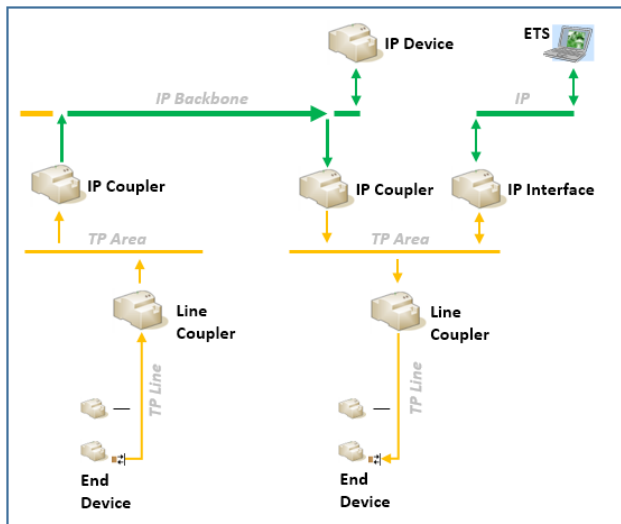
Interfacing with DALI

KNX is secure



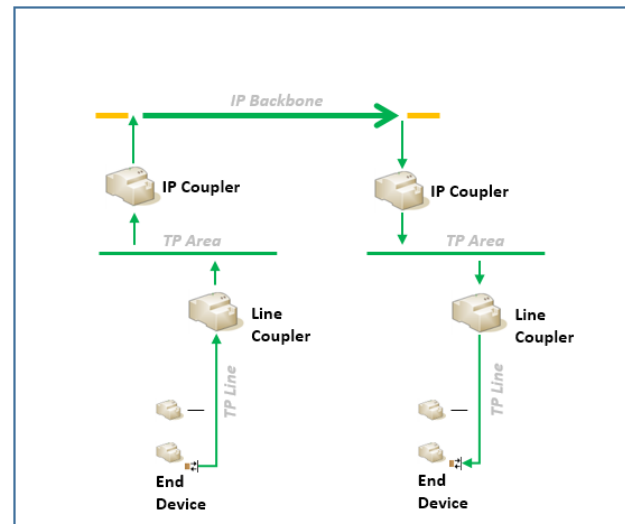
KNX Secure uses AES128 CCM for encryption/authentication and Diffie-Hellmann for a secure key exchange.

1 KNX IP Secure



All KNX telegrams between two (or more) IP couplers are **SECURED**

2 KNX Data Secure



The group communication of a particular sender (one or more group objects) to another group object(s) is **SECURED**

KNX is part of Internet of Things



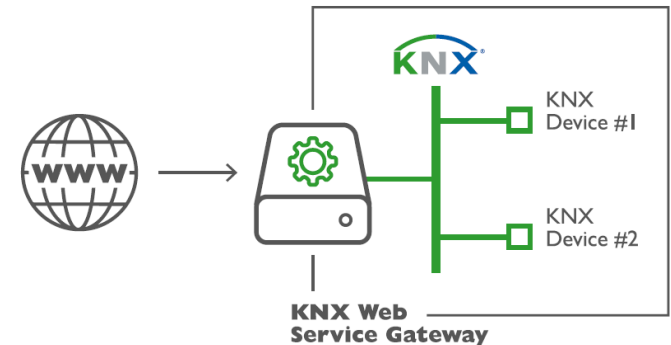
KNX current ecosystem

KNXnet/IP

KNX IoT 1.0

Web services

- A gateway maps the KNX project
- Using oBIX, OPC UA and BACnet-WS
- Open data exchange of values and states

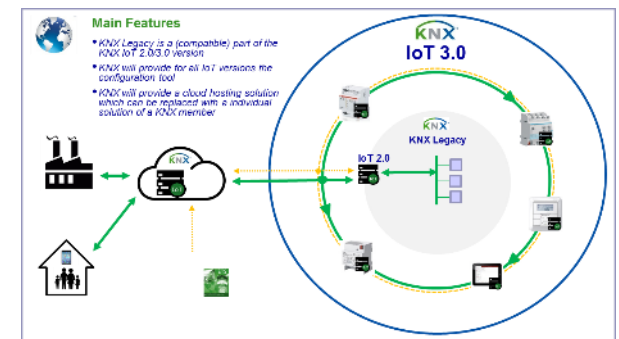


KNX IoT 2.0

2018: Plug & Play internet connected web services

KNX IoT 3.0

2020: Direct IP devices within KNX ecosystem
KNX devices sit natively on IP



KNX IoT 4.0

> 2020: Self-learning adopting system



KNX facts and figures

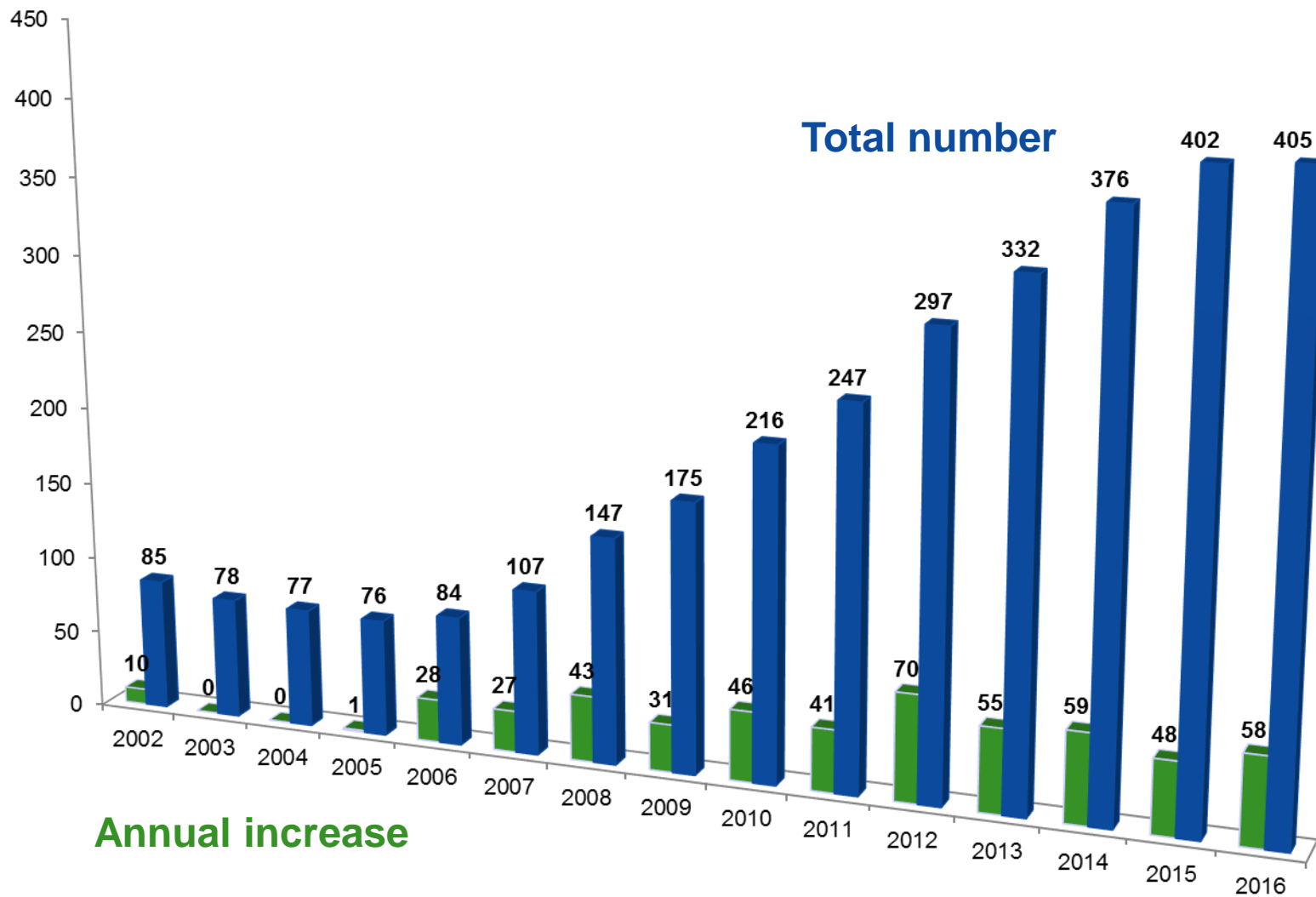
January 2017

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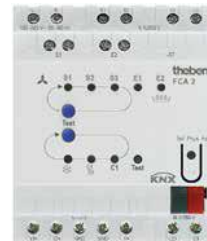
405 members in 42 countries



KNX members



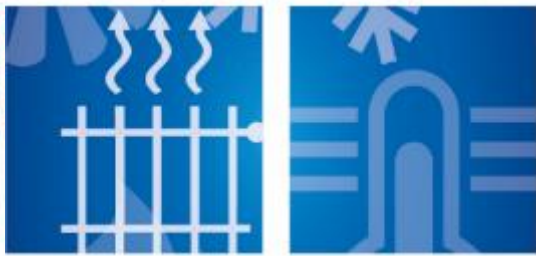
More than 7000 certified KNX products (samples of HVAC devices)



KNX facts & figures



- 405 KNX Members in 42 countries
- 7000 certified product groups
- 16 Test labs in 8 countries
- 66430 KNX Partners in 157 countries
- 400 Training Centers in 66 countries
- 20 Userclubs in 18 countries
- 44 National Groups
- 130 Scientific Partners in 33 countries
- 15 Associated partners
- ETS sold in 140 countries



**Heating, cooling, ventilation
with KNX**

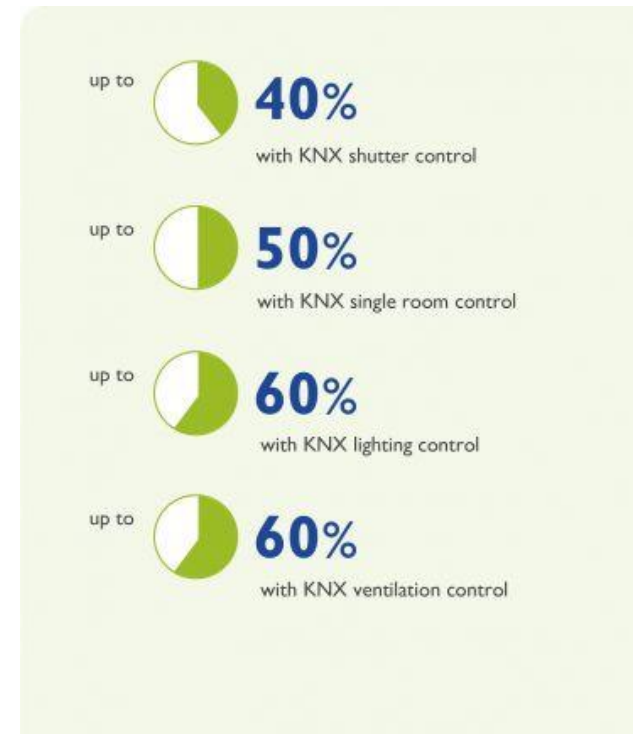
Systems and products

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Networking of the room automation functions



- If class A is to be achieved according to EN15232, the following is necessary:
 1. networking of energy-efficient room automation functions for all applications
 2. demand-oriented control
- KNX fulfills all technical requirements for the integration and communication of the different applications and products
- The integration of HVAC technology in home and building automation has long been part of standard KNX applications
- Currently over 70 manufacturers have registered KNX products with heating, ventilation and air conditioning applications



KNX has already shown in a variety of studies and projects that savings of 50 % to 60 % can be achieved through individual room control and ventilation control alone.

Individual room temperature control

Individual room temperature control offers the possibility of regulating the room temperature of a single room regardless of the temperature in other rooms.

- The current controllers are mainly complete, aesthetically sophisticated room controllers which also control all the other functions in a room.
- Some of the current controllers can also measure the CO₂ content and air humidity as well as support the heating and / or cooling operating modes.



1 Iddero: KNX 4.3" Touch Panel 2 Berker: KNX room controller with TFT display
3 Vitrum: Vitrum Clima Control 4 Basalte: Deseo temperature controller



5 Elsner Elektronik: Cala KNX Room Controller 6 MDT Technologies: Glass push button Smart II
7 ABB: ABB i-bus KNX Logic Controller ABA/S 1.2.1



8 Sauter: Room Controller ecos504/505 9 Bleu Comm Azur: realKNX Server
10 Siemens: Synco IC 11 Sinapsi: M-Bus/WM-Bus Web Server

Radiator and underfloor heating, cooling ceilings



Valves control the rate of flow in the individual heating and cooling circuits

- The triggering of the valves is normally carried out via analogue thermoelectric or motor valve drives.
- Motor valve drives with an integrated KNX interface...
 - can be very precisely positioned
 - mostly have additional intelligence and diagnostic functions
 - transfer both the current valve position and error messages via KNX



12 Insta Elektro: KNX Valve drive IB
13 Ekinex by SBS: KNX mixing actuator
14 MDT Technologies: Heating actuator

Fan coil controllers

A benefit of fan coil control is the rapid availability of thermal energy or cooling capacity. It is therefore widely used in hotels and office buildings.

- The control of the fan and the heating or cooling register is carried out via special KNX fan coil actuators in the unit while the operation is usually carried out via KNX room thermostats with extended functions and setting options.
- It is possible via KNX to separate the unit and the operation cost-effectively in terms of rooms.



15 Jung:
KNX Fan Coil Controller

16 Theben:
Fan Coil Actuator FCA 2 KNX

Interfaces to energy generation and distribution systems



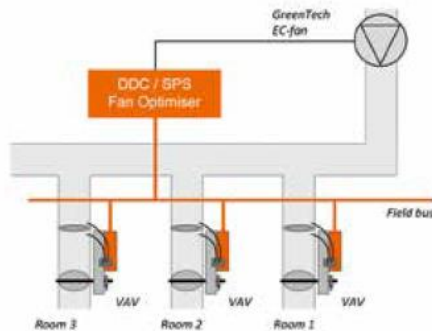
With interfaces to power generation systems it is possible:

- to display the current state of their heating system using the KNX visualisation system
- to predefine setpoint values and set operating modes
- Fault signals are automatically transmitted to KNX and displayed
- As the current heat requirement in the rooms can be communicated via the KNX gateway to the heating controllers, the heat generation must be precisely matched to the current demand.



17 ISE Individuelle Software-Entwicklung: ise smart connect KNX Vaillant 18 Viessmann: Vitogate 200
19 Stiebel Eltron: Internet-Service-Gateway (ISG) 20 Bosch: Bosch Gateway KNX 10 21 Wolf: Wolf KNX interface kit

Variable volume flow controller



- Based on the recorded room conditions and the current air requirement, energetically intelligent and demand-controlled systems can be set up with KNX.
- A central control unit permanently monitors the flap positions of the individual VAV boxes via KNX. If the flaps eliminate excessive inlet pressure, this is reduced.
- The aim is to operate the system with the lowest possible pressure loss.

22 Belimo Automation: VAV controller and actuators
23 Maico: KNX ventilation units with HR



Room air control and interfaces to ventilation systems



- In addition to the baseline values, the values for the room temperature, air humidity and carbon dioxide content measured by the KNX individual room controllers and air quality sensors can be transferred via the KNX interfaces to the ventilation system and taken into account during the control.
- In the other direction, the ventilation system transfers status signals to KNX which for example signal the necessary replacement of ventilation filters.



24 arcus-ed: KNX LUNOS-CONTROL4
25 Busch-Jaeger: KNX room temperature controller with CO₂ sensor
26 Hugo Müller: KNX air quality sensor
27 Vallox: VALLOX MV KNX bus module

Interfaces to distributed air conditioning systems



- The interfaces to the air conditioning systems are versatile. In addition to a few standardised interfaces, the manufacturers use a variety of proprietary hardware and protocol solutions.
- Special KNX gateways enable the integration of almost all the air conditioning devices into KNX.



28 Weinzierl Engineering: KNX Modbus Gateway 886

29 Astrum: VFACE – Ultimate VRF Interface

30 Pulsar: THINKNX BRICKBOX

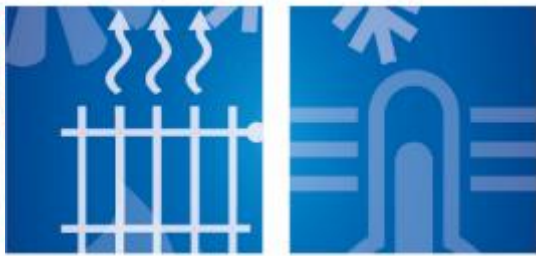
31 Intesis: IntesisBox Universal KNX AC Gateway

Over 7,000 certified KNX products

cover all the applications of heating,
ventilation and air conditioning

The KNX worldwide standard

thus offers the best requirements to improve the
energy efficiency of buildings.



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**Heating, cooling, ventilation
with KNX**

Case studies

Overview of case studies

- Case study 1:** Control and monitoring of the system functions of an HVAC device
- Case study 2:** Control and monitoring of temperature
- Case study 3:** Visualisation of HVAC relevant parameters
- Case study 4:** Optimisation for optional heat pump power consumption
- Case study 5:** Heat pump power consumption forecast

Case study 1 - Control and monitoring of the system functions of an HVAC device



The display and remote control of the operating modes (comfort, standby, night reduction) for the system functions (heating, cooling, ventilation and hot water) of a generator.

Case A: The user toggles the operating state via his smartphone.

Case B: The user starts the one-time heating of the hot water before showering.

Case study 1 - Control and monitoring of the system functions of an HVAC device



KNX solution for case A

Selection of the operating mode

The user has different options depending on the system configuration:

1. To set the operating mode centrally on the power generation system. The system affects the respective heating circuit (e.g. one floor).
2. To set the operating mode separately for each room via the visualisation using individual room temperature control.

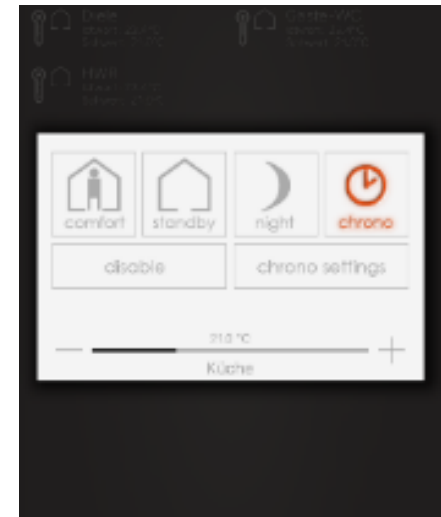


Photo: ThinKnx

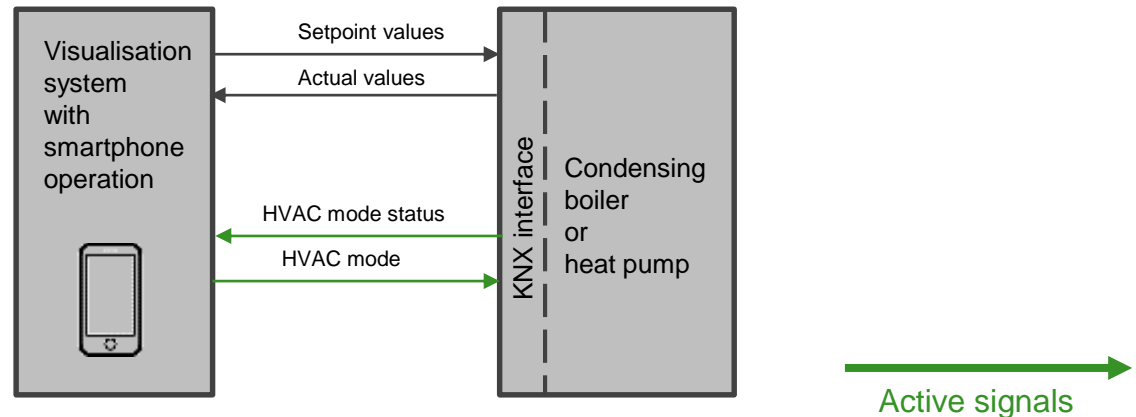
The setting under point 1 has the primary function.

Case study 1 - Control and monitoring of the system functions of an HVAC device



KNX solution for case A

1. The default operating mode is only carried out on the heat / cooling generator via a heating / cooling circuit with a corresponding feedback signal.



Selection and feedback of operating modes via HVAC mode, 1 byte / DPT 20.102 or 1 bit / DPT 1.00x

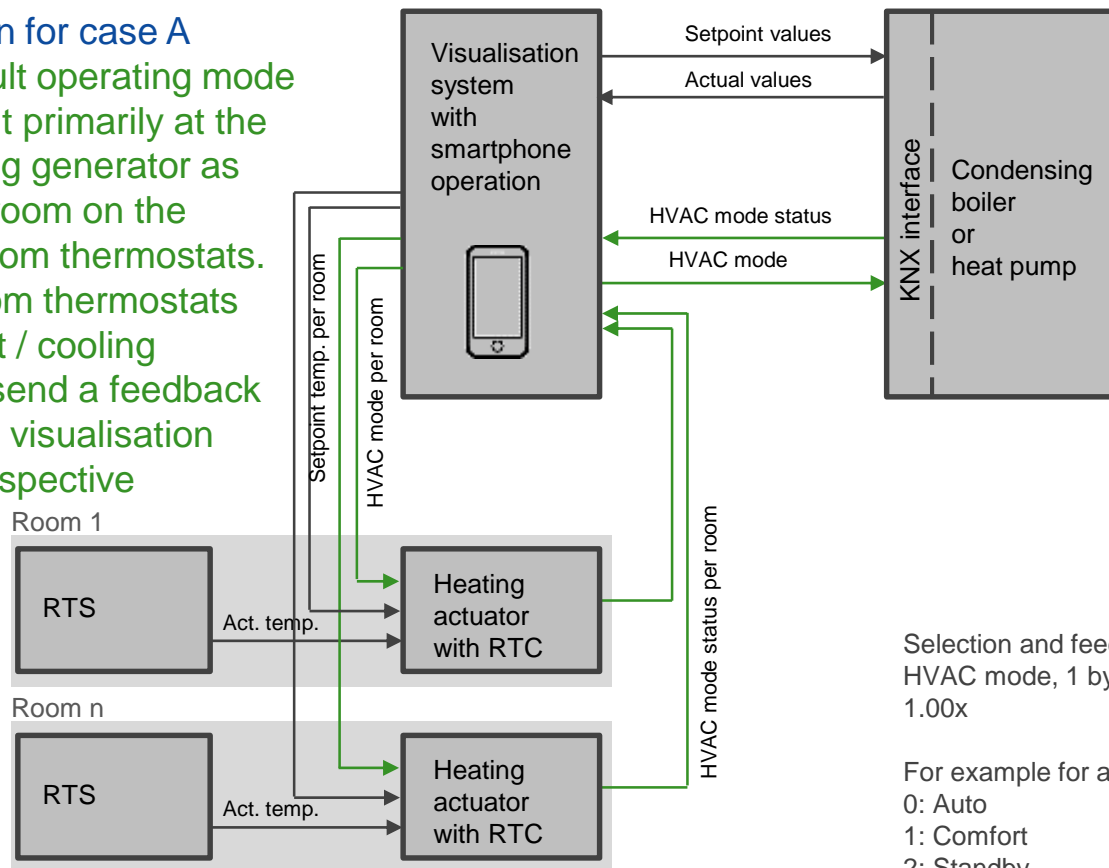
For example for a heat pump control:

- 0: Auto
- 1: Comfort
- 2: Standby
- 3: Economy
- 4: Building protection

Case study 1 - Control and monitoring of the system functions of an HVAC device



KNX solution for case A
 2. The default operating mode is carried out primarily at the heat / cooling generator as well as per room on the individual room thermostats. Both the room thermostats and the heat / cooling generators send a feedback signal to the visualisation about the respective status.



Selection and feedback of operating modes via HVAC mode, 1 byte / DPT 20.102 or 1 bit / DPT 1.00x

For example for a heat pump control:

- 0: Auto
- 1: Comfort
- 2: Standby
- 3: Economy
- 4: Building protection

RTS: Room temperature sensor
 RTC: Room temperature controller

Case study 1 - Control and monitoring of the system functions of an HVAC device

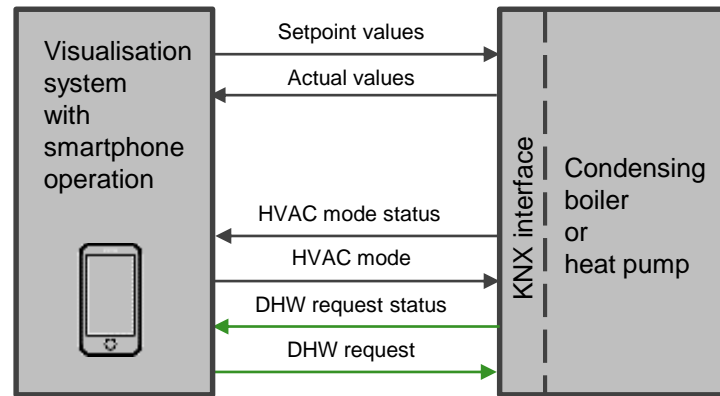


KNX solution for case B Domestic water heating

The one-time heating of the hot water e. g. via night mode, is triggered via a 1 bit command.

The status can be queried at the same object or a separate status object.

Alternatively, a temporary increase of the setpoint temperature of the hot water is possible.



One-time domestic hot water

1 bit, DPT 1.00x

Active signals

Case study 2 - Control and monitoring of temperatures



The display of actual and setpoint temperatures of rooms, zones / heating circuits as well as the remote control of setpoint temperatures and the optional creation of setpoint temperature time profiles are among the standard functions of an individual room temperature controller.

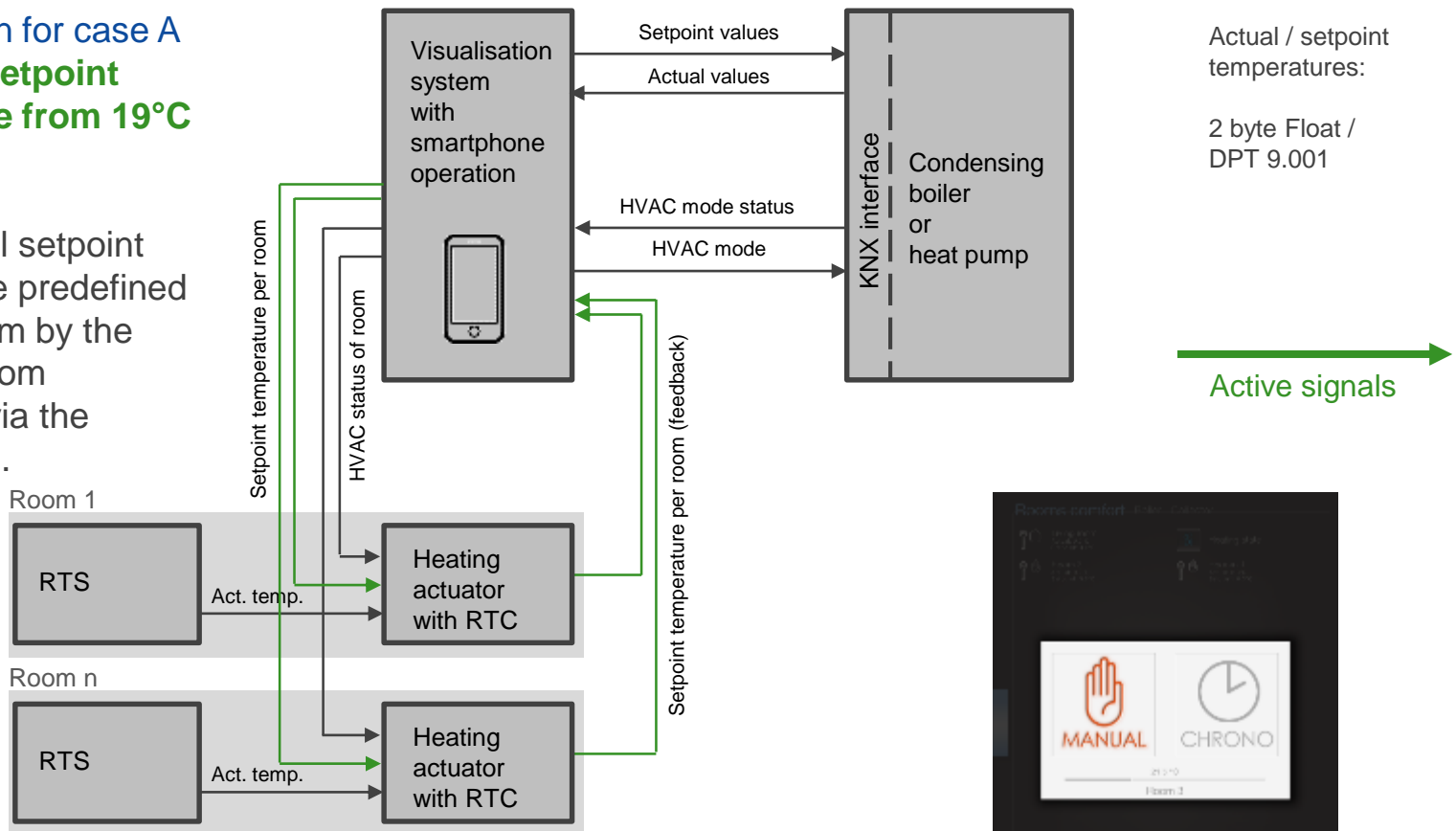
- Case A:** The user sets the setpoint temperature from 19°C to 21°C.
- Case B:** The user would like the room temperatures to be displayed via a smartphone.
- Case C:** An energy manager optimises the inlet temperature of a heating circuit / zone using the predefined room temperatures.
- Case D:** The user configures time profiles so that the corresponding rooms have achieved the comfort temperature at the time of usage.

Case study 2 - Control and monitoring of temperatures



KNX solution for case A Changing setpoint temperature from 19°C to 21°C

An individual setpoint value can be predefined for each room by the individual room thermostat via the visualisation.



Actual / setpoint temperatures:

2 byte Float / DPT 9.001



photo: ThinkKnx

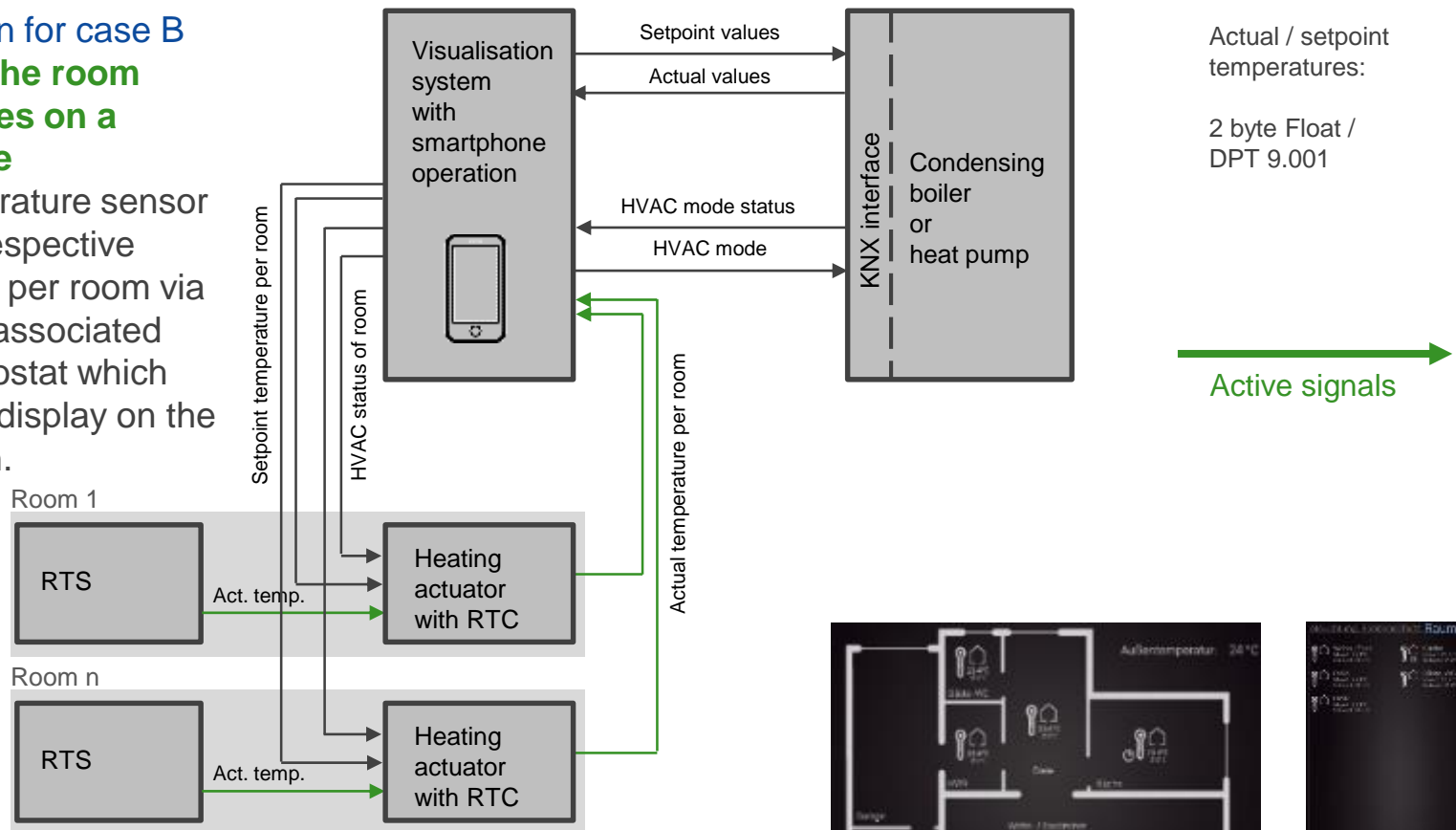
RTS: Room temperature sensor
RTC: Room temperature controller

Case study 2 - Control and monitoring of temperatures



KNX solution for case B Display of the room temperatures on a smartphone

Each temperature sensor sends the respective actual value per room via KNX to the associated room thermostat which routes it for display on the visualisation.



Actual / setpoint temperatures:

2 byte Float /
DPT 9.001



photo: ThinKnx

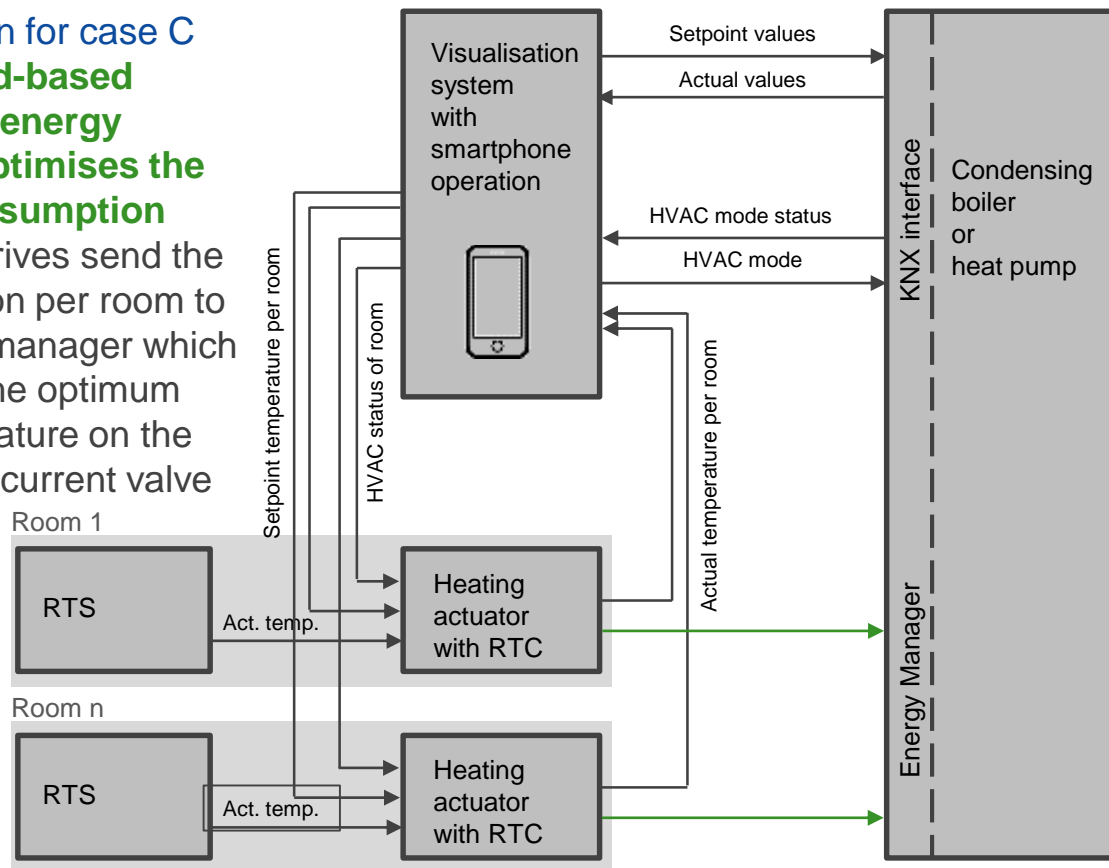
RTS: Room temperature sensor
RTC: Room temperature controller

Case study 2 - Control and monitoring of temperatures



KNX solution for case C For demand-based control, an energy manager optimises the energy consumption

The valve drives send the valve position per room to the energy manager which calculates the optimum inlet temperature on the basis of the current valve positions.



Actual / setpoint temperatures:
Value_temp
2 byte Float /
DPT 9.001

Valve lift:
Percent (0..100%),
1 byte, DPT 5.001

→
Active signals

RTS: Room temperature sensor
RTC: Room temperature controller

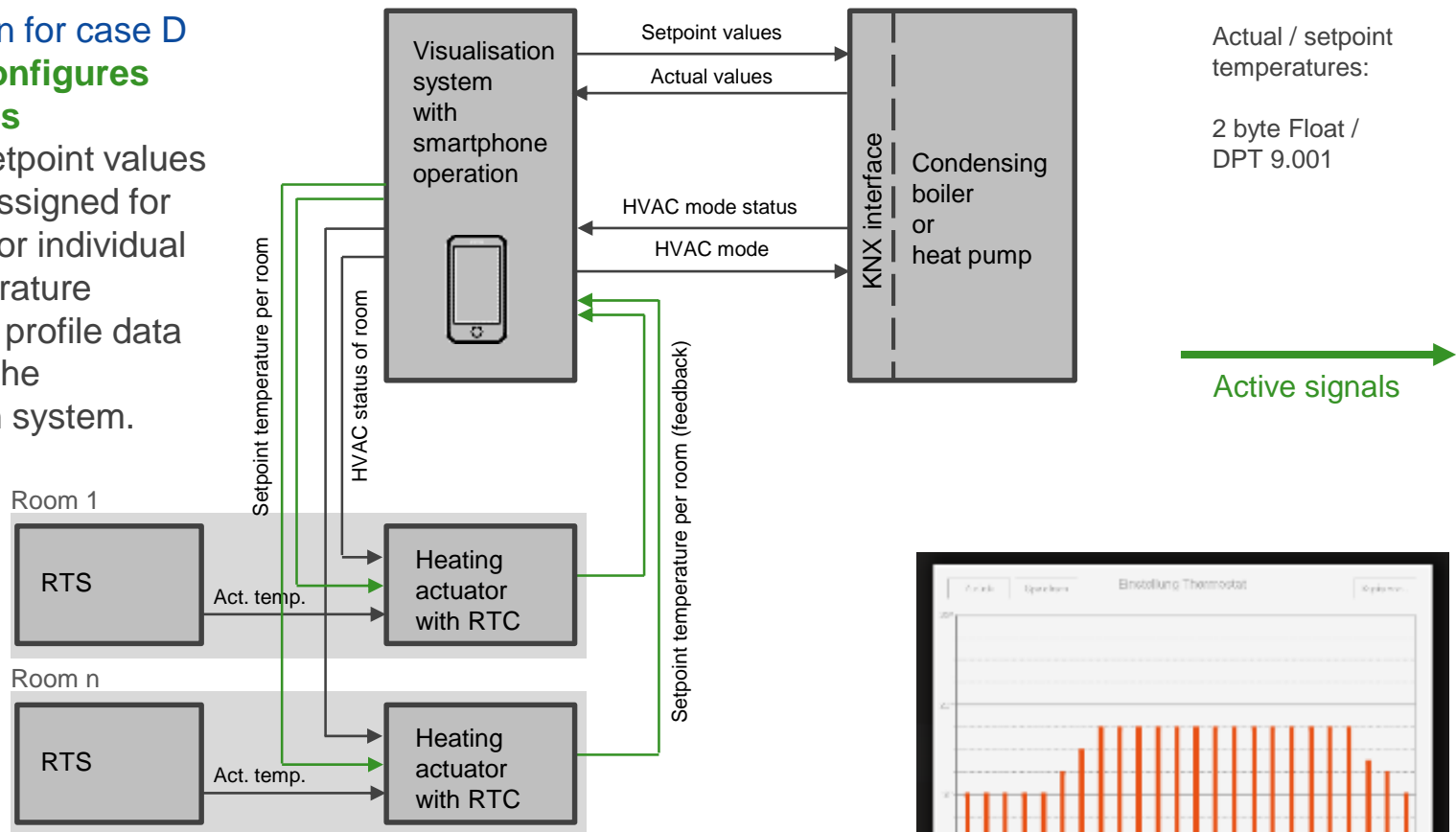
Case study 2 - Control and monitoring of temperatures



KNX solution for case D

The user configures time profiles

Individual setpoint values can be preassigned for each room for individual room temperature control. The profile data is stored in the visualisation system.



Actual / setpoint temperatures:

2 byte Float / DPT 9.001

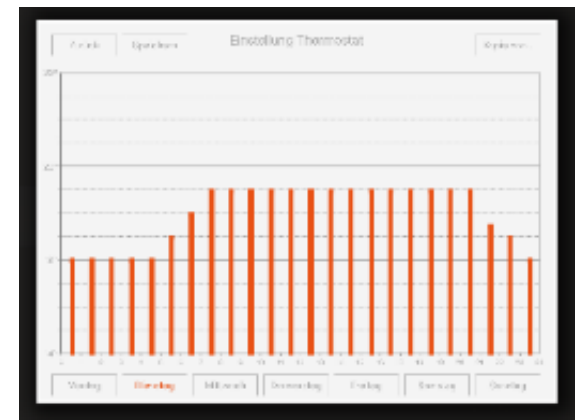


photo: ThinKnx

RTS: Room temperature sensor
 RTC: Room temperature controller

Case study 3 - Visualisation of HVAC-related parameters



Display of HVAC-specific parameters

- Case A:** The user would like the power consumption of HVAC devices to be displayed.
- Case B:** The user would like the operating state (normal operation, faults, service requirements ...) to be displayed via smartphone.
- Case C:** The next service interval should be indicated to the user.

Case study 3 - Visualisation of HVAC-related parameters



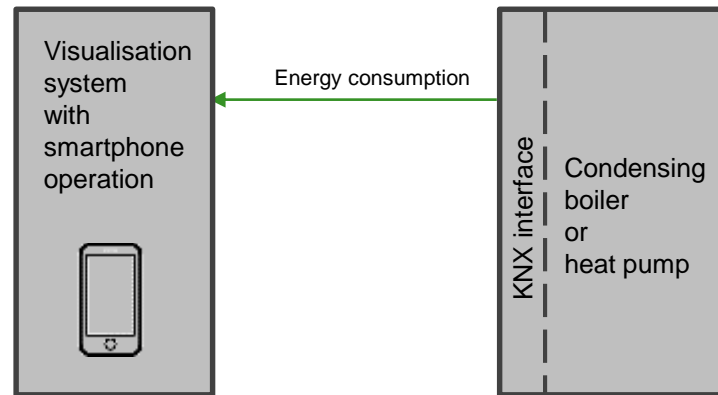
KNX solution for case A Power consumption of HVAC devices

Current heating controllers mainly make the energy consumption available as an absolute value on the KNX:

- electricity for heating
- electricity for hot water
- gas for heating
- gas for hot water

The energy consumption values are prepared in the visualisation system and displayed as:

- diagrams
- absolute values
- daily, weekly, monthly or annual values



Energy consumption: real energy (kWh)
4 byte / DPT 13.013



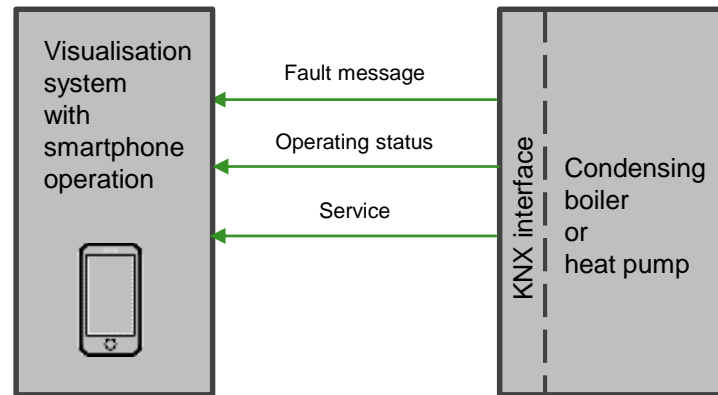
Case study 3 - Visualisation of HVAC-related parameters



KNX solution for case B Displaying operating states on the smartphone

Almost all the operating states can be queried via the KNX interface and displayed in the visualisation including: heating, cooling, active heating program, day / night mode, HV pumps, DHW heating, active electric night heating, service, etc.

When there are system errors, error messages are automatically sent to the visualisation via the KNX, either as individual fault messages or as group messages (“Faults of heat generator”).



Fault message,
Operating status:

1 bit / DPT 1.00x
1 byte / DPT 6.020
1 byte / DPT 20.xxx

Case study 3 - Visualisation of HVAC-related parameters

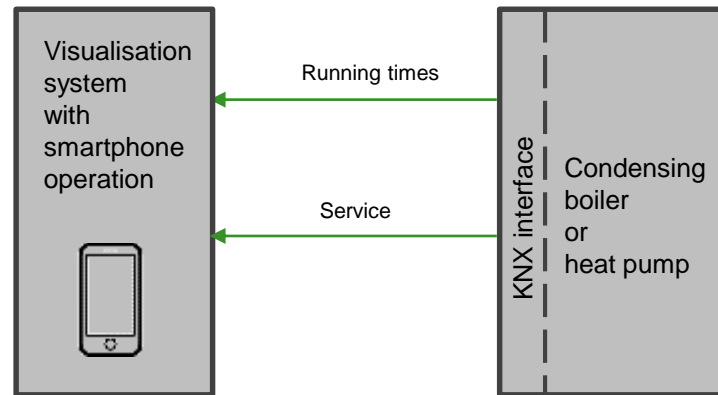


KNX solution for case C

Note about the next service interval

The note about the next service date can be carried out in different ways:

1. The heat / cooling generator determines the necessity of a service appointment itself and sends a request in the form of a yes / no telegram to the visualisation system.
2. The running times of the HV and storage pumps, compressors, electric heaters etc. are sent as absolute values to the visualisation, compared with the specified maintenance intervals and the next service period is calculated.



Running times:
TimePeriodHrs
2 byte / DPT 7.007

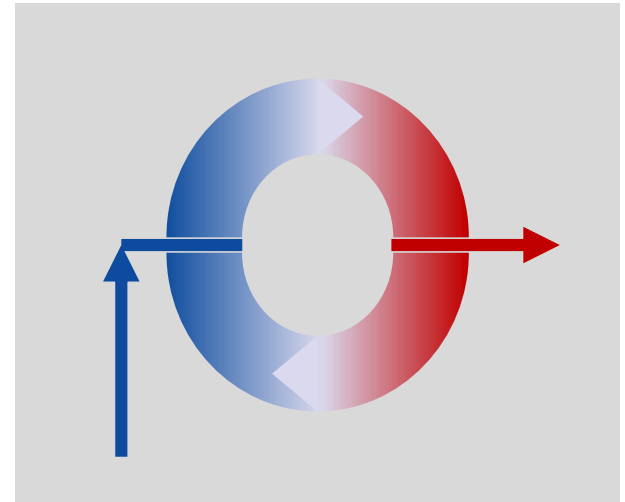
Case study 4 - Optimisation for optional power consumption of heat pumps



Heat pumps belong to the most energy-intensive devices in the building. There is therefore a high added value for the customer to integrate these systems in the energy management so that they can be operated cost-effectively.

Case A: The service water is heated if the electricity is reasonable.

Case B: The heating or cooling is carried out within a tolerance range defined by the customer if the electricity is reasonable.



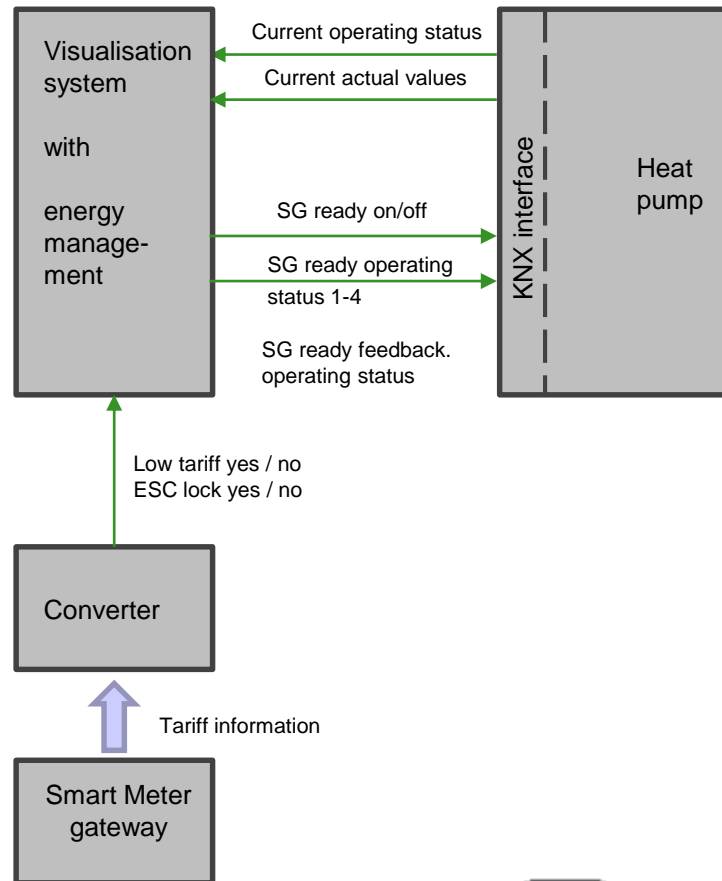
Case study 4 - Optimisation for optional power consumption of heat pumps



KNX solution for cases A/B
Heat pumps can represent optional processes (e.g. heating or cooling) on the communication interface, so that these processes can be started by an energy management system under favourable conditions.

Use of SG ready functions for heat pumps with Smart Grid capability

- Operating status 1 is backward compatible to utility lock, incorporates a maximum lockout period of two hours
- Operating status 2 the energy-efficient normal operation with pro-rata filling of thermal store for the maximum lockout period of two hours
- Operating status 3 is the controller mode for heating rooms and water
- Operating status 4 is a definitive start-up command



SG ready operating status:
1 bit / DPT 1.0xx

SG ready mode
1 byte / DPT 20.xxx



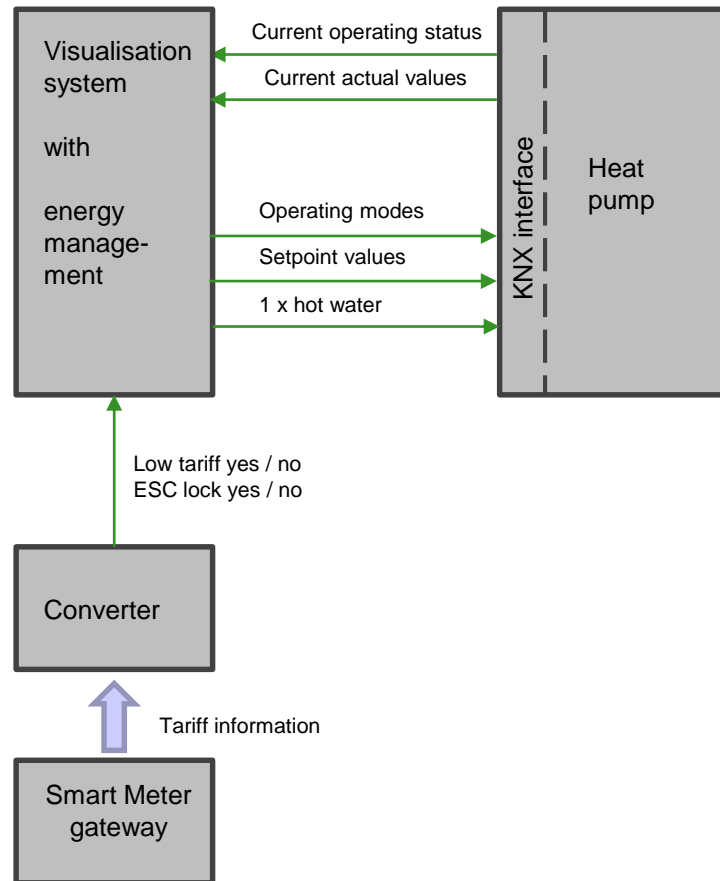
<http://www.waermepumpe.de/waermepumpe/sg-ready/>

Case study 4 - Optimisation for optional power consumption of heat pumps



KNX solution for cases A/B
Heat pumps can represent optional processes (e.g. heating or cooling) on the communication interface, so that these processes can be started by an energy management system under favourable conditions.

Control with a conventional heat pump via operating modes and setpoint values.

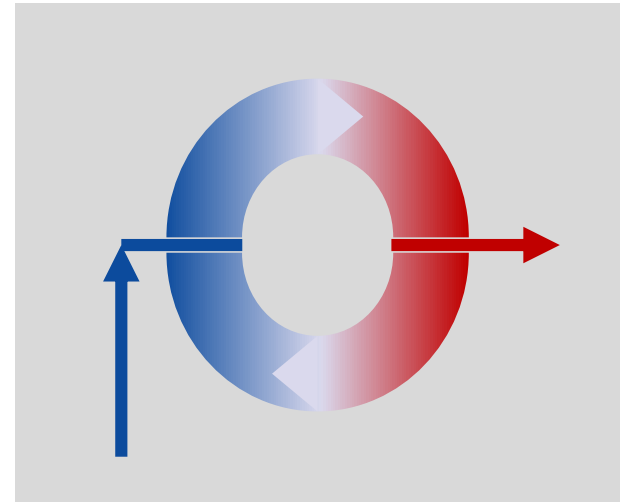


Case study 5 - Heat pump power consumption forecast

Heat pumps belong to the most energy-intensive devices in the building. There is therefore a high added value for the customer to integrate these systems in the energy management so that they can be operated cost-effectively.

Case A: Further energy-intensive processes which exceed the domestic current of the PV system are prevented from starting during the heating cycles.

Case B: The user can be shown when heating cycles take place and at what price.

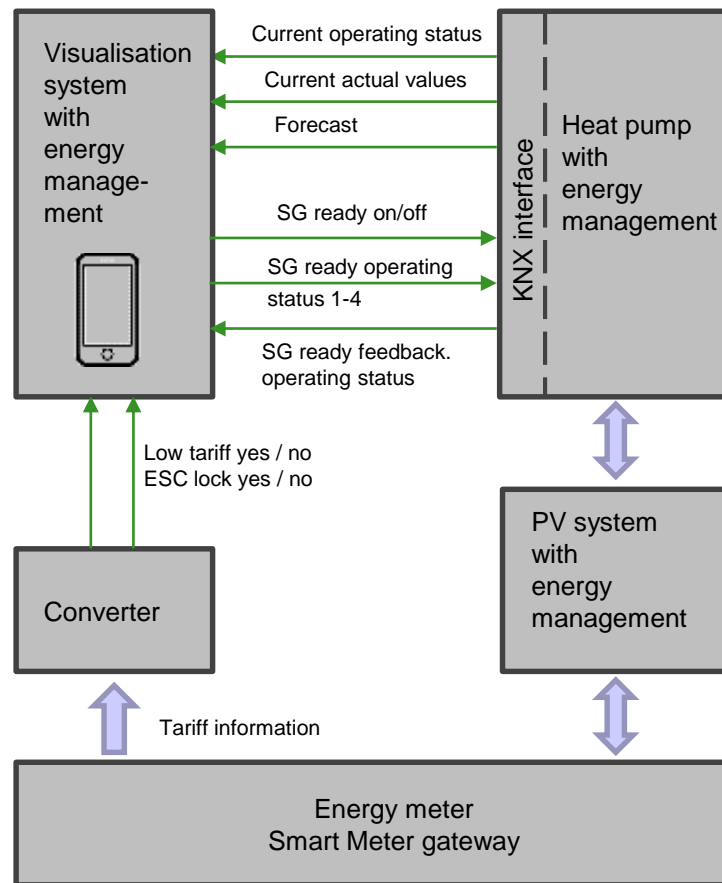


Case study 5 - Heat pump power consumption forecast



KNX solution for cases A/B
 Heat pumps can represent optional processes (e.g. heating or cooling) on the communication interface, so that these processes can be started by an energy management system under favourable conditions

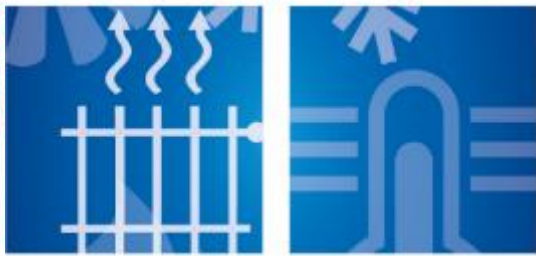
Operating states and forecast data can be communicated by heat controllers to a visualisation program via the KNX and displayed as values, diagrams or graphics.



The heat pump determines the thermal energy demand of the building and communicates the power requirement to the PV system.

The PV system plans the operating time of the devices under consideration of a yield and consumption forecast so that the power consumption makes an optimum contribution to the domestic consumption.

The heat pump converts this proposal dependent on the operating state and thus increases the domestic consumption. Electrical energy is converted into thermal energy cost-effectively and stored temporarily in the house.



**Heating, cooling, ventilation
with KNX**

HVAC specifications

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HVAC specifications

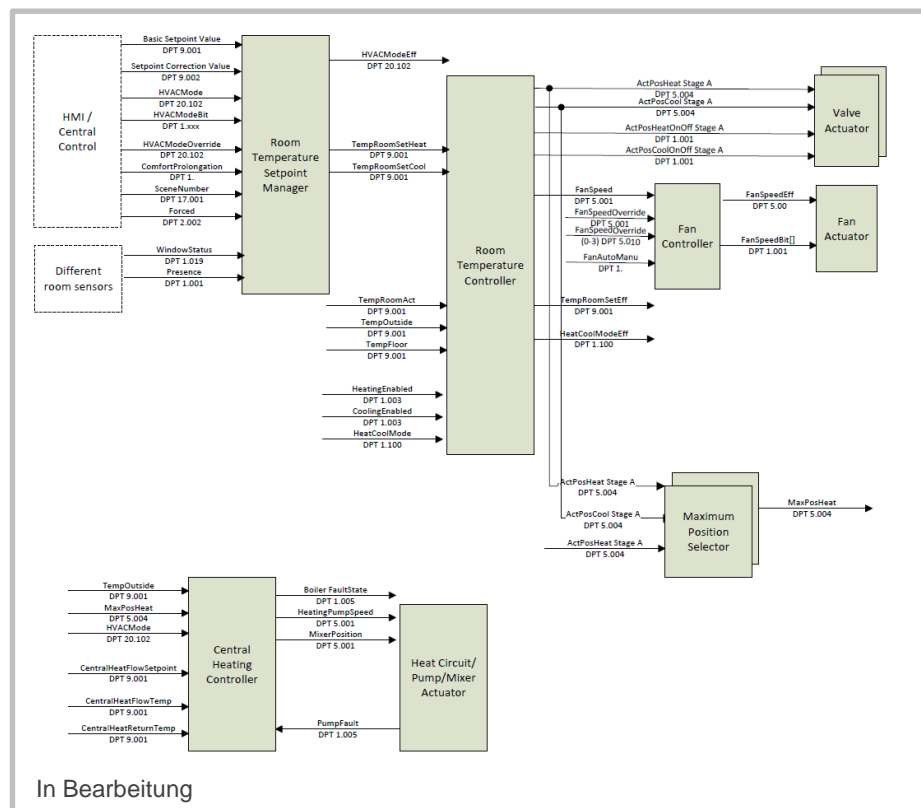
Specification of Application Descriptions for S-Mode devices

- In recent years, applications and requirements have been added which are no longer covered by the "ObIS Application Description" (e.g. due to new datapoint types)
- The KNX WG-I updates the HVAC ObIS ADs and the function block assignments.
- Implementations in development and system integration are significantly facilitated.
- The "Channel specifications" and specifications for LTE devices remain unaffected.

HVAC specifications

HVAC S-Mode application model

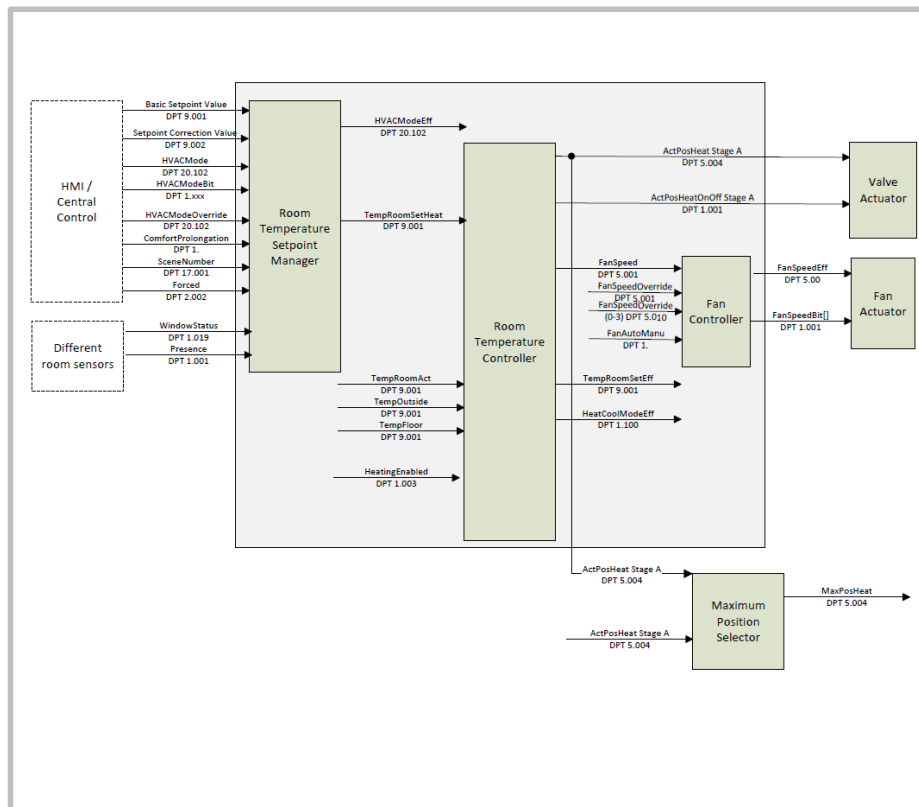
- Function blocks, communication objects and dependencies are clearly structured and defined for HVAC applications
- For manufacturers and system integrators



In Bearbeitung

HVAC specifications

HVAC S-Mode room controller



- The application-specific configurations can be derived from the overall scheme
- Here: room controller only heating

HVAC specifications

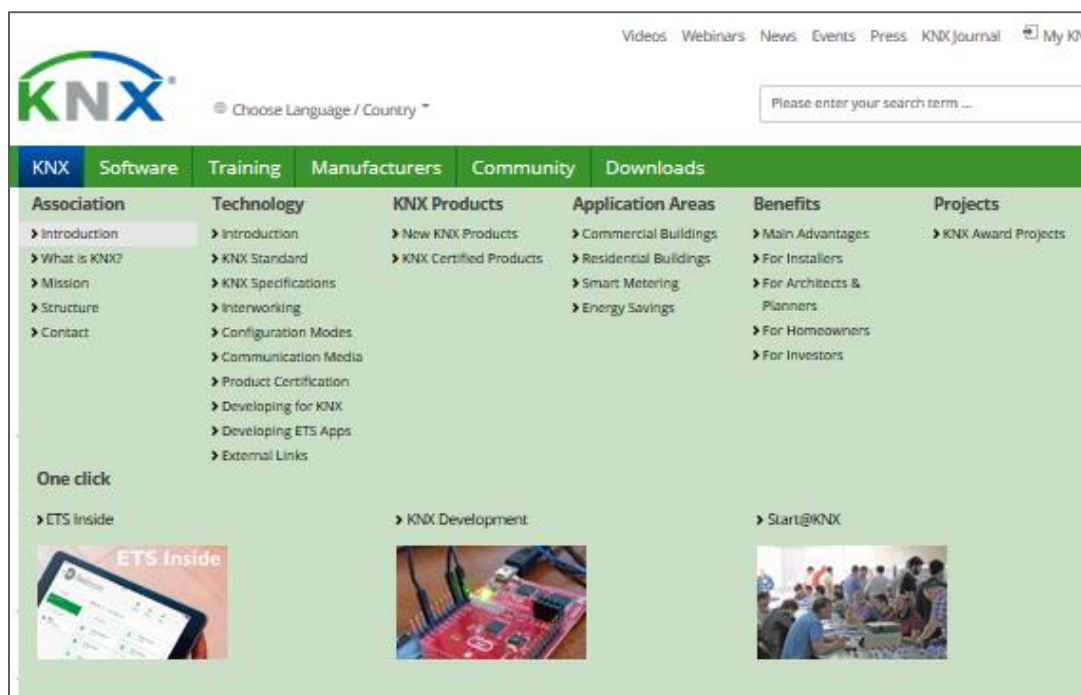
Datapoint types (DPT)

- DPTs are available for all HVAC applications
- The complete description of the relevant DPTs are contained in "Volume 7" of the KNX specifications

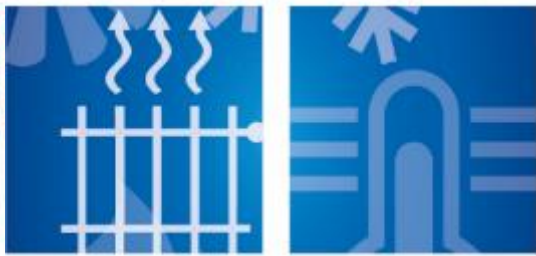
Name	DPT_ID	Encoding	Size (bit)	Description
DPT_Enable	1.003	B ₁	1	To enable or disable all types of modes e.g. comfort mode.
DPT_Trigger	1.017	B ₁	1	Sent by a push button or display to inform the room temperature controller that the room will be occupied for a longer period. ("Party Mode").
DPT_Occupancy	1.018	B ₁	1	Between a presence detector, a push button or other sensors to inform the room temperature controller about the room occupancy.
DPT_Window_Door	1.019	B ₁	1	Between door and window sensors to inform the room temperature controller that a door or window is open.
DPT_Heat/Cool	1.100	B ₁	1	Supplied by a controller to make the system either heat or cool.
DPT_Scaling	5.001	U ₈	8	Used for controlling the speed of fans, between off and full speed, even fans with a different number of discrete speeds.
DPT_Percent_U8	5.004	U ₈	8	Controlling the position of valves.
DPT_Value_Temp	9.001	F ₁₆	16	Used for setpoint for room temperature, actual room temperature, boiler temperature, outside temperature
DPT_Value_Tempd	9.002	F ₁₆	16	To adjust the setpoint by a few degrees up or down.
DPT_Value_AirFlow	9.009	F ₁₆	16	How much air (m ³ /h) is currently flowing through the ventilation system at any location?
DPT_PowerDensity	9.022	F ₁₆	16	A sun intensity sensor reports on the intensity of the sunlight, which will heat the room from outside, so that the room temperature controller can take this into account.
DPT_HVACMode	20.102	N ₈	8	Common encoding to indicate whether the house or building should be heated or cooled as normal, or should save energy, when nobody is in, or even more when the building or house is not occupied for a long time. The setpoint temperatures result from this.
DPT_StatusRHCC	22.101	B ₁₆	16	For a room temperature controller to report its current operation state and device state.
DPT_TempRoomSetp SetF16	222.100	F ₁₆ F ₁₆ F ₁₆	48	Setpoint temperature values for comfort, standby and economy mode given by a supervisor (display, scheduler...) to the room setpoint manager.
...

HVAC specifications

Where can I find the KNX specifications and information on the technology?



www.knx.org → **KNX** → **Technology**



**Heating, cooling, ventilation
with KNX**

HVAC website

www.knx.org

HVAC website



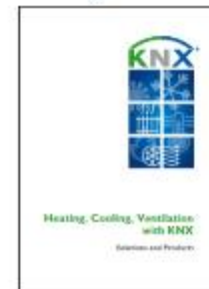
Networking of the room automation functions

In addition to classic lighting and sun protection control, applications for heating, ventilation and air conditioning (HVAC) in particular form an essential part of modern room and building automation. As a worldwide standard for home and building system technology, KNX also integrates further applications.

Considering that home and building automation accounts for 40% of the total energy consumption, energy efficiency is paramount as well as an increase in comfort. The energy efficiency of buildings as well as the influence of building automation is described in the European standard EN 15232. The methods described there evaluate the influence of the building automation and the technical building management on the energy consumption. The standard classifies building automation and control systems into four energy efficiency classes A to D. While efficiency class C only requires the minimum legal standard without energy saving automation, the networking of energy efficient room automation functions is necessary for all applications and demand-oriented control to achieve class A.

KNX offers not only the technical requirement for the integration and communication of the different applications and products but has already shown in a variety of studies and projects that savings of 50% to 60% can be achieved through individual room control and ventilation control alone.

KNX Flyers



Available in 2 languages

 Download (1,6 MB) ▾

<http://hvac.knx.org>



Membership of the KNX Association

www.knx.org



Membership of the KNX Association

Why join the KNX Association?

1. Profit from the promotional value of using the KNX trademark on your products



- As a sign of quality, **only KNX members are able to use the KNX logo** on their KNX certified devices and on their KNX-related promotional material.
- Let your KNX devices and company be part of the worldwide network of providers of KNX certified products.

Membership of the KNX Association

Why join the KNX Association?



2. Boost the international profile of your products and company

Benefit from the impact of publications in the **KNX Journal**

- read by more than 100,000 people in 125 countries
- free presentation of any new KNX member to the KNX community and free promotion of your latest KNX products

Membership of the KNX Association

Why join the KNX Association?

4. The KNX team and community at your service

- As a KNX member, the Brussels KNX team is at your service for support related to KNX administration, certification, testing, marketing and tool licensing issues.
- Via the KNX Working Groups, you can exchange views with other involved KNX members on KNX related matters.

IHRE ANSPRECHPARTNER



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Membership of the KNX Association

Why join the KNX Association?

5. Privileged access to KNX tools

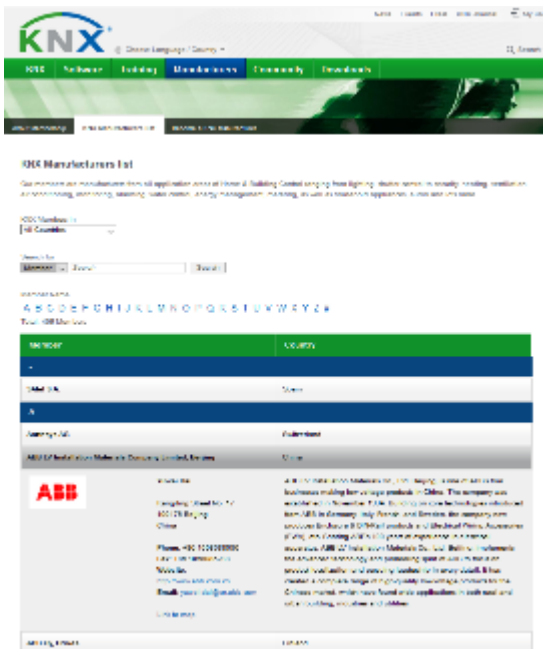
- As a KNX member, only you have access to the specialised KNX tools such as the KNX ETS Manufacturer tool for the creation of KNX ETS product descriptions and EITT, the uniform KNX conformity test tool.



Membership of the KNX Association

Why join the KNX Association?

6. Extend your worldwide visibility through the KNX website



- Your company name will appear on the international KNX website, translated into many languages and also constituting the communication platform for the KNX country organisations (KNX National Groups) in the individual countries (so far more than 40).

Membership of the KNX Association

Why join the KNX Association?

7. Influence the KNX decision-making process



- You can participate in the KNX Working Groups and KNX Task Forces, the driving forces in KNX marketing and communication, as well as technical aspects.
- As a shareholder you have the opportunity to influence the future of KNX by participating in official KNX decisions during the KNX annual general meeting (AGM).

Membership of the KNX Association

Why join the KNX Association?

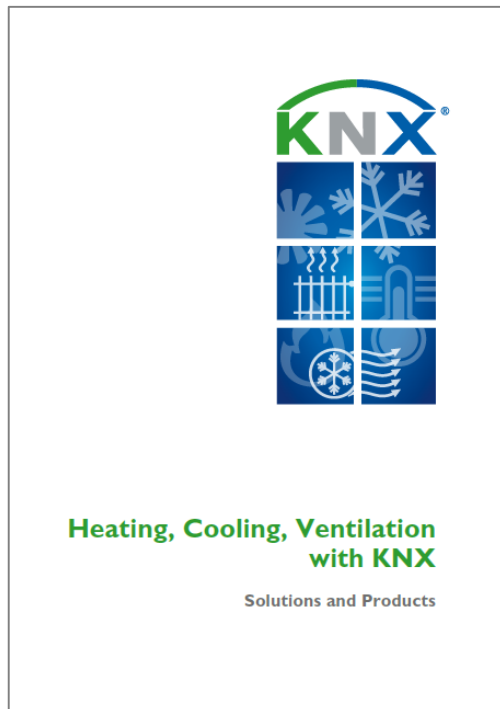
8. Open up new markets through your involvement in KNX

- Participate in KNX events organised in several countries or get involved in local KNX National Groups.

 <p>NATIONAL KNX Germany</p> <p>ZVEI Katalogausstellung 13. - 17. 11. 2016 Frankfurt (Deutschland) Kap Europa / Ebene 1 Sollten Sie Katalogausstellung / Hand in Hand mit dem Internet der Dinge www.zvei.de</p>	 <p>European Utility Week 15. - 17. 11. 2016 1. Homenote de Lidropes (Barcelona / Spanien) Jährliche Veranstaltung für die Energiebranche Europas www.european-utility-week.com</p>
 <p>GET Nord</p> <p>Get Nord 17. - 19. 11. 2016 Hamburg (Deutschland) Fachmesse für Elektro-, Sanitär, Heizung und Klima www.get-nord.de</p>	 <p>Smart Domestic & Slim Wires 23. - 24. 11. 2016 Eindhoven (Niederlande) Messe für Haus- und Gebäudetechnik (Elektronik) www.smart-home.nl</p>
 <p>eurosills Göteborg 2016</p> <p>Euroskills 2016 1. - 3. 12. 2016 Göteborg (Schweden) Europas größter internationaler Wettbewerb der Berufe www.euroskills.org</p>	 <p>Integrated Systems Europe</p> <p>ISE 2017 7. - 10. 2. 2017 Amsterdam (Niederlande) Europa Nr. 1 - Messe für die professionellen AV- und Datenkommunikationsindustrien www.iseurope.org</p>
 <p>BATBOUW</p> <p>Batbouw 2017 16. - 26. 2. 2017 Brüssel (Belgien) Messe für Haus- und Gebäudetechnik www.batbouw.be</p>	 <p>ISH</p> <p>ISH 2017 14. - 18. 3. 2017 Frankfurt (Deutschland) Messe für Sanitär, Gebäudetechnik, Klima- und erneuerbare Energien www.himmelstruktur.com</p>

Membership of the KNX Association

Why join the KNX Association?



9. Enhance your campaigns with free KNX PR material

- Common PR material such as KNX brochures, merchandise... is available from KNX to support you when creating more awareness for KNX with new customers.

Membership of the KNX Association

Why join the KNX Association?

10. Stay informed on the latest developments in international standardisation

- KNX has partnerships with many international standardisation organisations, with the purpose of further embedding KNX in international standards: in view of this privileged position, KNX will be able to keep you posted on the latest developments in standardisation of new home and building control related standards.



Membership of the KNX Association

Why join the KNX Association?



Start video “How to become a KNX member”

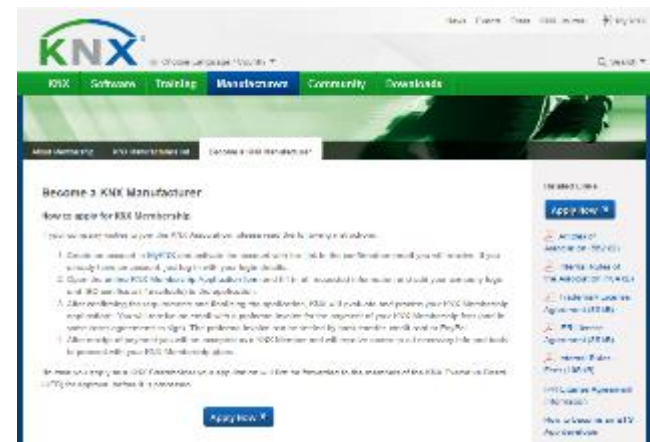
Membership of the KNX Association

Where can I find membership information?

1.



2.



www.knx.org → “Become a KNX member”



KNX
The worldwide STANDARD
for
home and building control

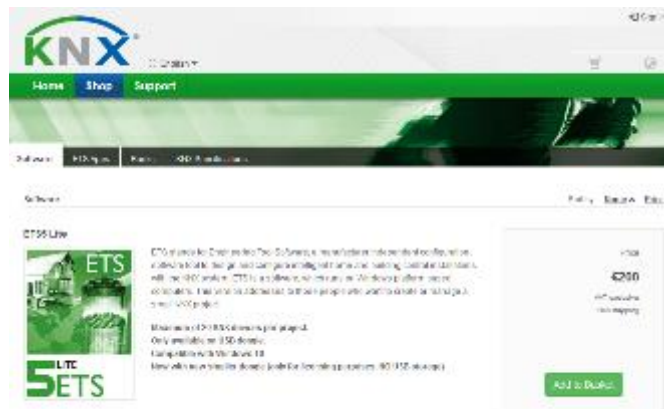
KNX Association International

www.knx.org

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**Thank you very much
for your attention**

**For any questions, contact
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