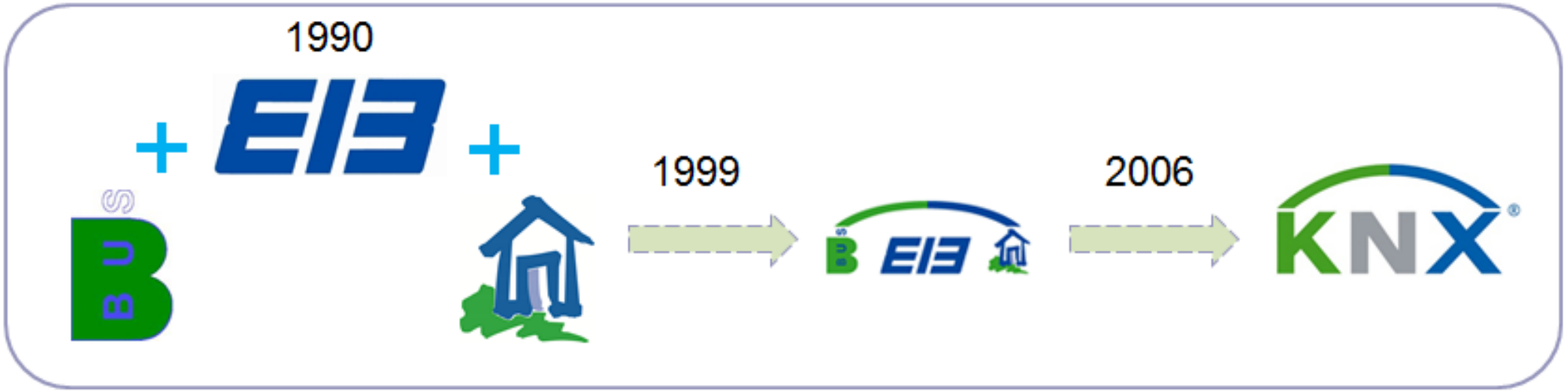
Introduction to KNX System

CONTENTS

Part 01

Systematic Argumentation

KNX Association established its headquarters in Brussels (Belgium) in 1990, and its name was "EIB Association"



In 1999, EIB Association merged with **Batibus** and **EHS** Association to form "KNX Association".

BCI: run the **Batibus** system (France)

European Home Systems Association: devolop the **EHS** system (Netherlands)

Goals of KNX Association:

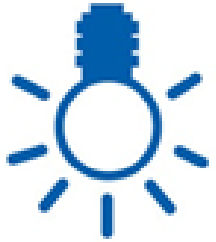
- Defining a brand-new and open standard for smart homes and buildings.

- Shaping the KNX trademark as a symbol of quality and huge supplier source.

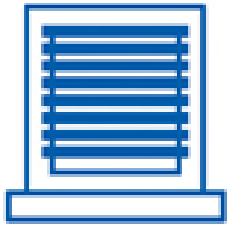
- Establishing KNX as the standard of smart homes and buildings around Europe and even the whole world.

- Decentralized layout to reduce the wiring cost
- High transparency of installation
- System device can be added at any time

Provide a wide range of application solutions

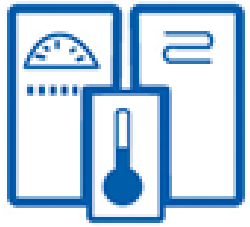


Lighting



Blinds & Shutters

Security



Energy Management

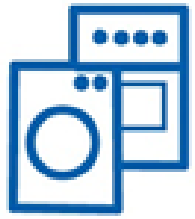
HVAC

Monitoring

Remote Control

Metering

Audio/Video Control



White Goods

HDL and KNX

- Became the first member of manufacturers in China to join KNX Association in 2006.
- Became a manufacturer member of KNX China in 2008.
- Became a board menber of KNX China in 2017.
- Became a board menber of KNX HK user club in 2017.
- 测试中心

KNX is a Standard Protocol → Easy to integrate with Third party device

Buspro is a Private Protocol Owned by HDL →

1.Easy to programme devices
2. Able to remote access project

Part 02

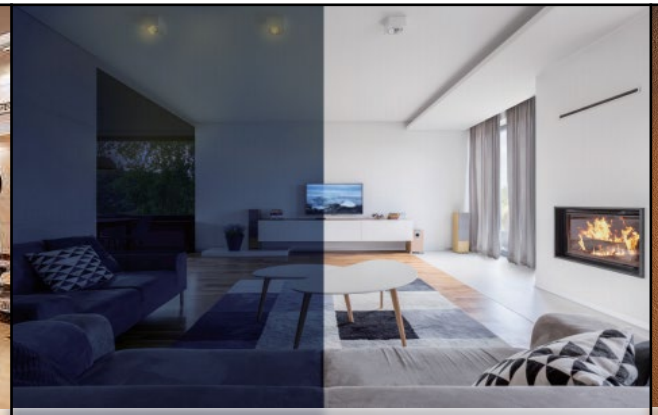
Introduction of Product and Function


HDL®
Lighting Control

Lighting Control

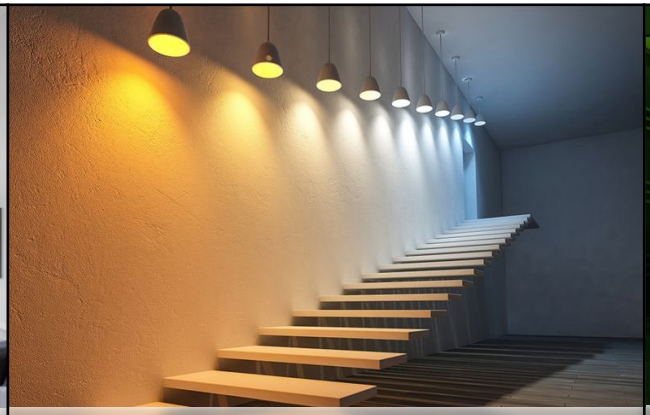
ON/OFF

Application Area: All Area



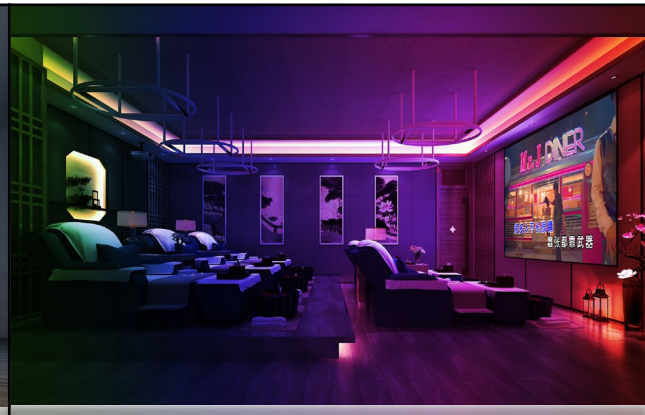
Brightness

Application Area: Cinema, Study



CCT

Application Area: Living room, Dinning room



RGB

Application Area: Cinema, Bar

Smart Lighting

Scenario-based lighting

Starting from the lighting design (scientific lighting design, reasonable light points, various light types), the scenario lighting incorporates smart lighting dimming control modules to achieve a wide variety of scenario applications. In addition, the simple operation enhances the using experience and enables users to switch scenarios efficiently, so that they can have an immersive experience at home.

Viewing mode

Switch to Viewing mode with just a click.
Smart linkage of lighting and audio-video devices
Improve immersive experience and viewing ambience

Reading mode

Switch to Reading mode with just a click.
Create a quiet, focused lighting environment
Alleviate reading fatigue and protect the eyes.

Tea mode

Switch to Tea mode with a single click.
Adjust color temperature and illuminance according to the tea being served.
Illuminate the tea-drinking area, with a faint halo of light around it.

Bright mode

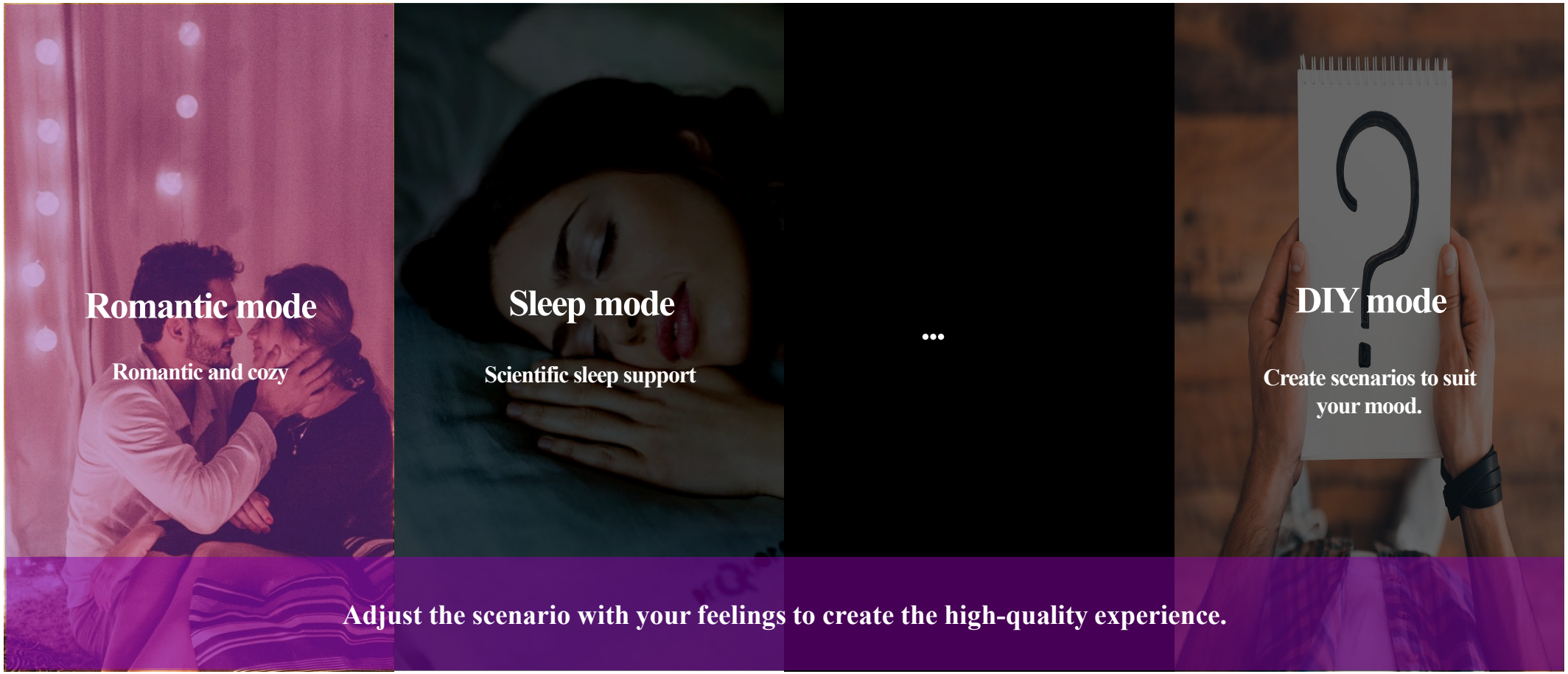
Switch to Bright mode with a single click.
Simultaneously illuminate the entire house with multiple sets of lights.
Making it easy to do cleaning, find objects and serve guests

Lighting Control | Example

Daily

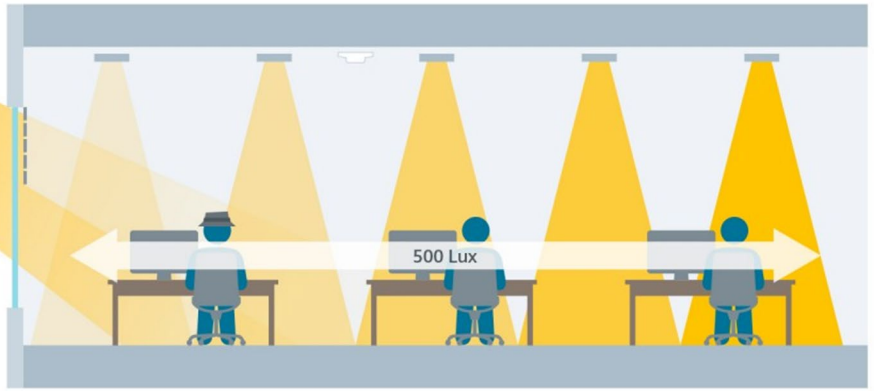
Entertainment

Scenario-based lighting



Constant lighting control

Natural lights
Curtain and dimmer interaction



Lux sensor

Dimmers

Omnisense sensor - HDL-M/HSD24.1

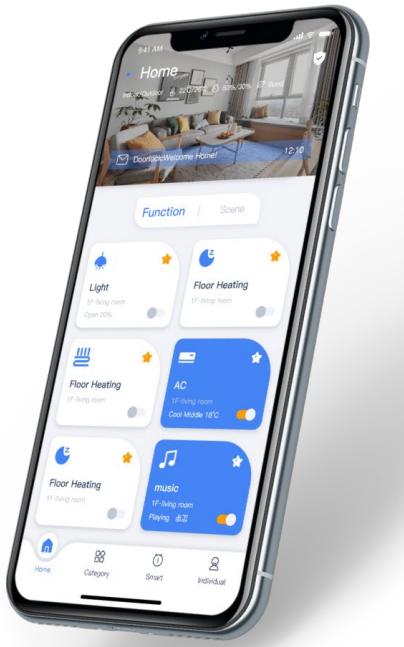
MINI PIR and Lux Sensor- HDL-M/IS05.1-D

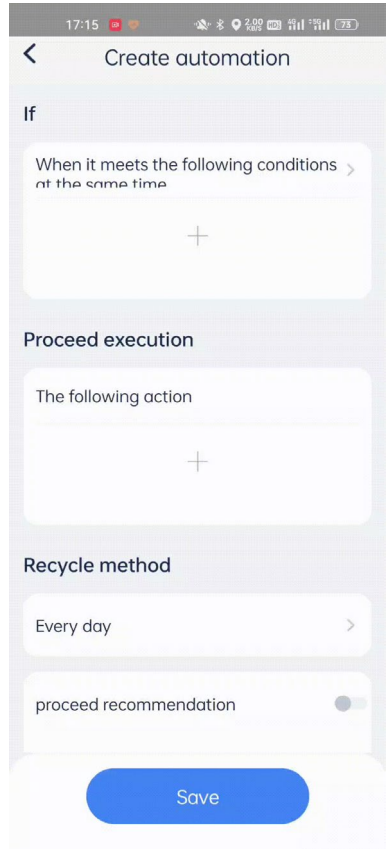
Ceiling mount Ultrasonic sensor- HDL-M/US05.1

Ceiling mount PIR and Lux Sensor- HDL-M/HS05.1-D

Dimmers with different technology:
Leading&Trailing
DALI
0-10V
DMX


HDL
KNX
LAN
KNX


Home
Function
Scene
Light
Floor Heating
Floor Heating
AC
Floor Heating
music


17:15
Create automation
If
When it meets the following conditions at the same time
Proceed execution
The following action
Recycle method
Every day
proceed recommendation
Save

On Pro

Smart Lighting

Product matrix

Smart lighting system

Adjustment of light brightness and color

DALI dimming actuator

Adjustment of light/colors

Dimming actuator

Light adjustment

0~10V dimming actuator

Light adjustment

2/4/6CH MOSFET dimming actuator

Light adjustment

48CH DMX512 controller

Adjustment of light and color

On and off switch

4CH switch actuator

Centralized switch

8CH switch actuator

Centralized switch

12CH switch actuator

Centralized switch

Automatic control

Logic automation module

Timing control

Motion Sensor

Sensing control

Outdoor microwave sensor

Sensing control

Presence sensor

Sensing control

KNX Gateway

Shading system

Smart Shading Control

Problems of conventional shading system

- It's time-consuming and inefficient to open and close the roller blinds, floor to ceiling curtains and other types of shades in the house. either they are too high, too heavy and there are too many of them.
making it inconvenient to operate.

- It's troublesome to open and close the shades every time you go to sleep, getup, watching movies, reading book etc.

...

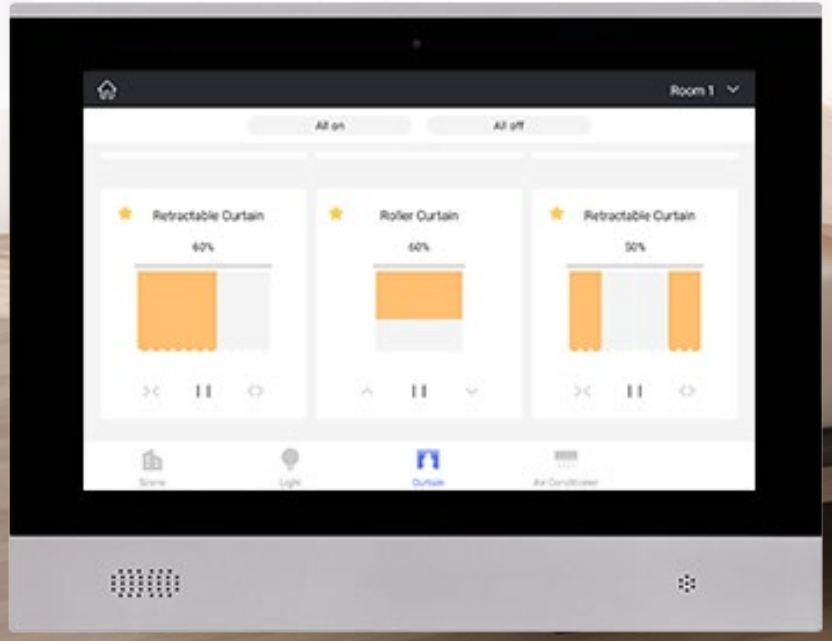
HDL®

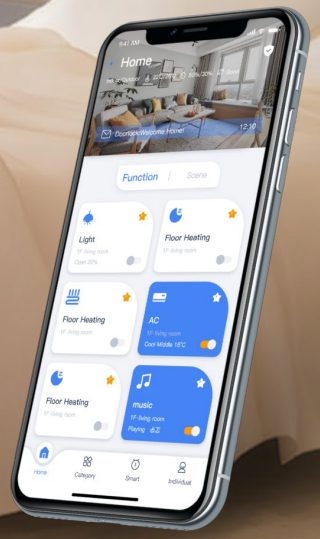
Automatic control

Single unit control, group control and percentage control by touch panel ,phone app locally and remotely, as well as voice control like Alexa, google Home, etc

The centralized/group touch control can open and close all of the shades with just a click.

...





Shading Control

HDL smart home system is able to control curtains and blinds. You can always find the right solution for your windows. Intelligent shading control creates a balance between natural and artificial light sources. This allows a home to maximize and harmonize the lighting effectively.

Smart shading Control

Product matrix

Smart window-control system

Window control

Curtain actuator

Window actuator control

Folding arm window actuator

Window controls

Window chain actuator

Window controls

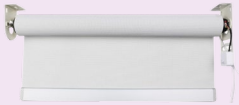
Shading control

Curtain actuator

Control curtain motors

Curtain motor

Control curtains



Blind motor

Control blinds

Sensors

Rain sensor

Detect rain

Wind light rain sensor

Detect wind, light and rain

Dry contact module

Scenario coordination

Climate System

HDL®

Remote control
Centralized control
Auto control

Smart panel Mobile control

Floor Heating AC Air Quality

Smart climate Control

Product matrix

Smart environmental control system

AC and ventilation control

Air-conditioning module

Control of fan coil units

232 module

Control protocol for air conditioning

IR emitter

Air-conditioning control via IR code

Floor heating control

6CH floor-heating module

Floor-heating control

232 module

Control protocol for the temperature controller of floor heating

Auto control

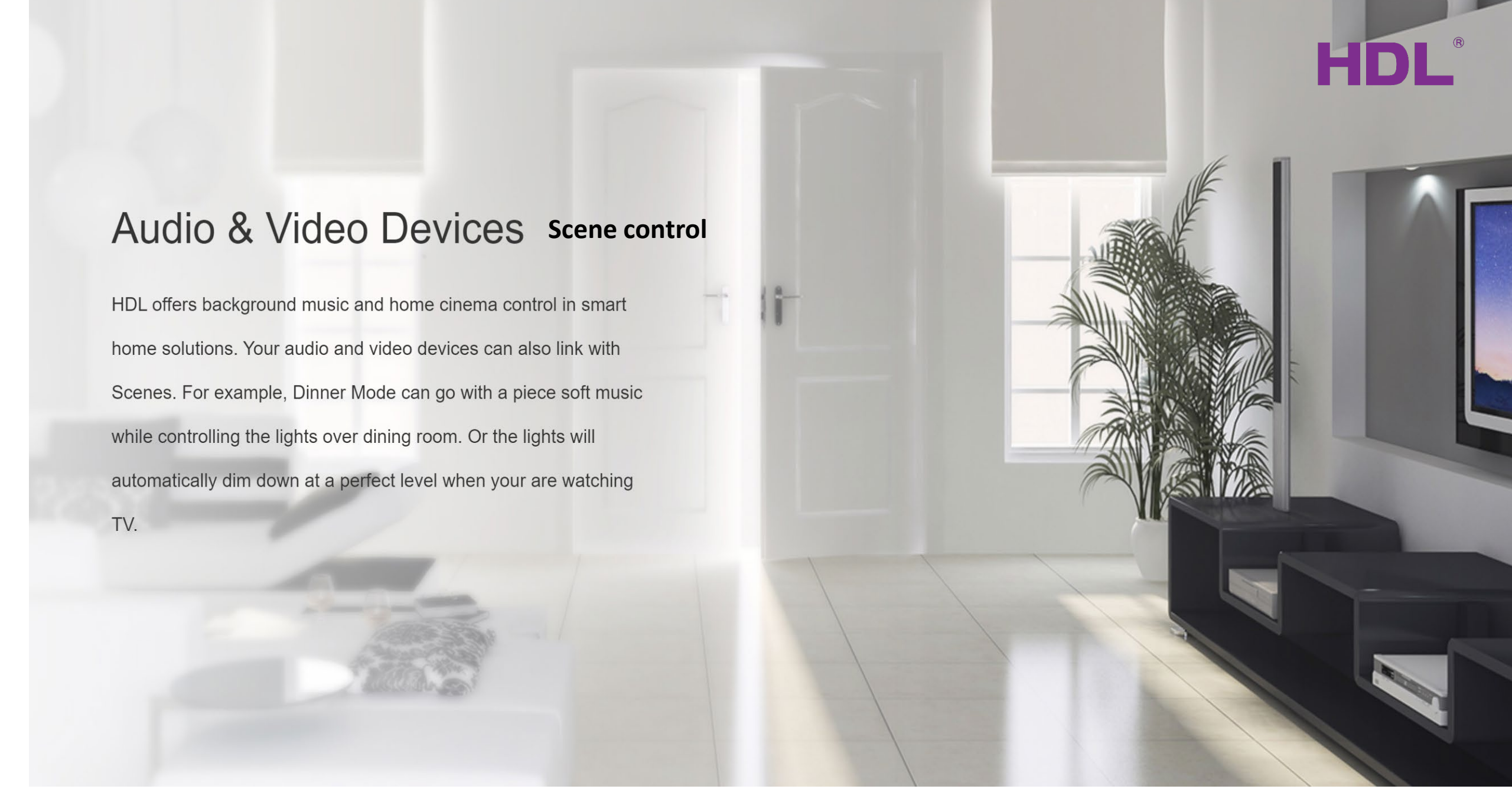
Presence sensor

Detect human presence


HDL®
AV Control

Audio & Video Devices **Scene control**

HDL offers background music and home cinema control in smart home solutions. Your audio and video devices can also link with Scenes. For example, Dinner Mode can go with a piece soft music while controlling the lights over dining room. Or the lights will automatically dim down at a perfect level when your are watching TV.



HDL®

232/485 interface module

Control protocol 485-ready devices

IR emitter

Control IR protocol devices

Smart Audio and Video

Home cinema: The audio-video centralized control host provides convenient operation of various cinema devices (smart projector, audio system, amplifier, Blu-ray player, KTV system, jukebox, game host, etc.) while the smart lighting system and smart environmental control system enable one-click switching of various modes, including the Bright, Viewing, KTV and Game modes.

The control interface

Voice control

Free your hands, add fun
Turn on the lights, close the curtains, turn up the temperature, play movies

Auto control

With the Sensing technology, logic and timing control, the system will run by itself to benefit the users.

Phone app

Phone app: Real-time checking, remote operation, scenario setting
Tablet: Mobile operation, centralized management on one device

Smart panel

Touch-control panel: Adjust air conditioning and lighting freely
Button panel: Simple and elegant interface, easy management

Part 03

System Topology

KNX

Control panel

- Touch screen
- Touch panel
- Multi-function LCD panel
- Mechanical button panel

Controller

- Relay
- LED dimmer
- Curtain controller
- Air conditioning controller
- Logic controller

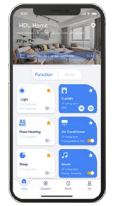
Sensor

- Air quality sensor
- light sensor
- Multifunctional sensor

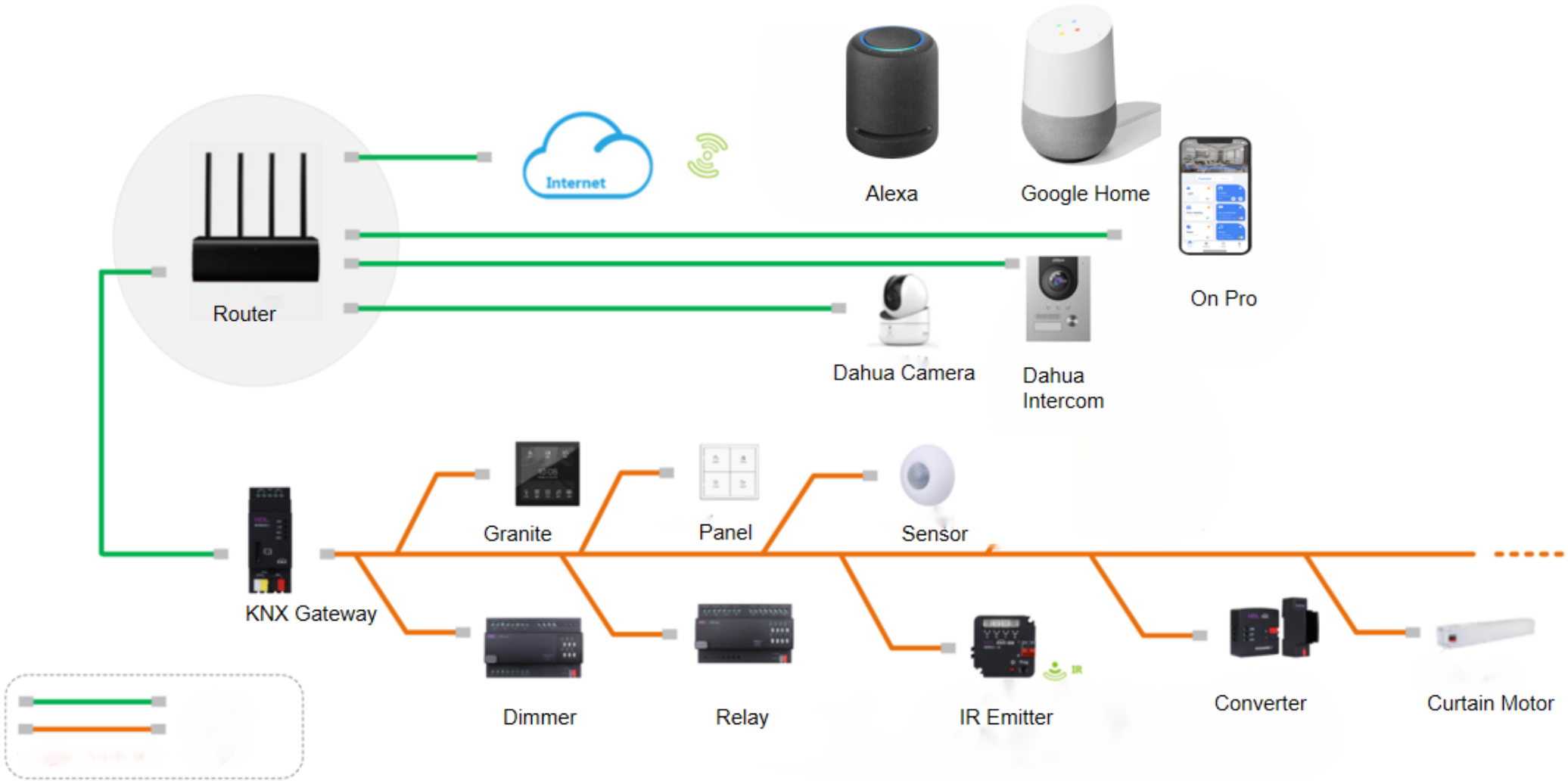
Gateway

- KNX Gateway
- RS232 converter
- RS485 converter

- Background music player



- Studio-System software
- On Pro-Smart home APP
- AIoT-Commercial building monitoring software


Internet
Alexa
Google Home
Router
On Pro
Dahua Camera
Dahua
Intercom
Granite
Panel
Sensor
KNX Gateway
Dimmer
Relay
IR Emitter
Converter
Curtain Motor

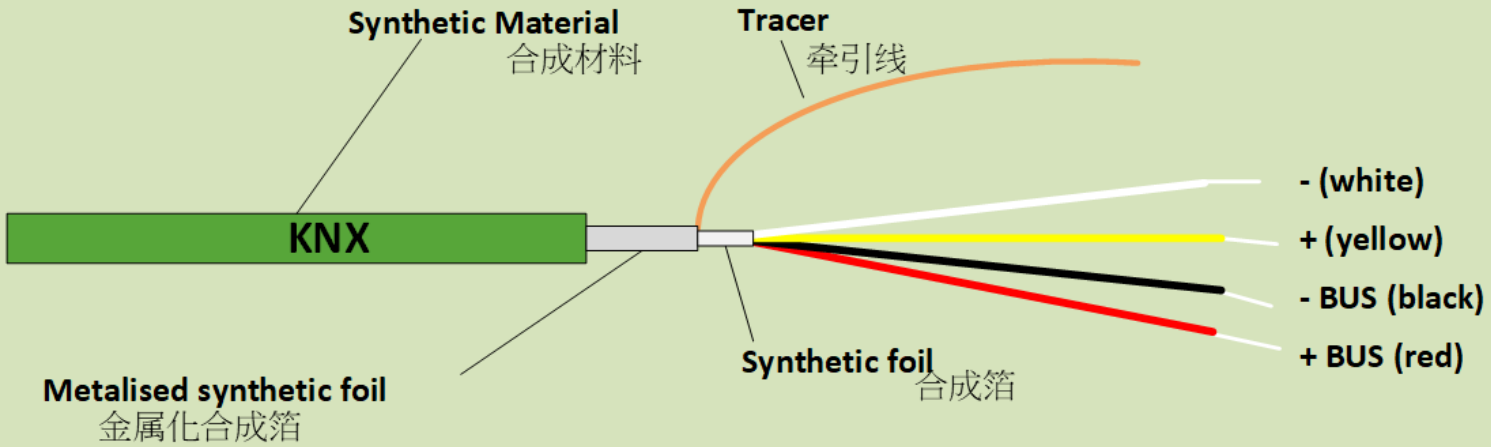
General category of KNX special cables

YCYM 2×2×0,8

- Fixed installation: applicable to dry, damp and wet rooms; wall-mounted, recessed, using casing;
- Outdoor installation: avoid direct sunlight;
- Test voltage: 4 kV according to EN 50090

J-Y (St) Y 2×2×0,8

- Fixed installation: applicable to dry and damp industrial places; wall-mounted, recessed, using casing;
- Outdoor installation: recessed or using conduit;
- Test voltage: 2.5 kV according to EN 50090



Bus connector

Usage

- Joints, extensions or connections are realised by means of bus connectors
- Bus cable shall only end either at the device itself or at this terminal
- Removal of bus devices without interrupting the bus
- Mechanical protection against reverse polarity

960mA System power supply

Roles:

1. Provide standard communication voltage for KNX system.

2. Communication cable short-circuit protection.

3. Control the communication voltage within the working range.

KNX Gateway

Functions:

1. Enable KNX zone/line isolation.
2. Data filtering.
3. Download commissioning data.
4. Achieve data monitoring for ETS or monitoring device.

KNX IP router

Functions:

1. Enable KNX zone/line isolation.
2. Data filtering.
3. Download commissioning data.
4. Achieve data monitoring for ETS or monitoring device.

KNX Line Coupler/Repeater

- Common functions:

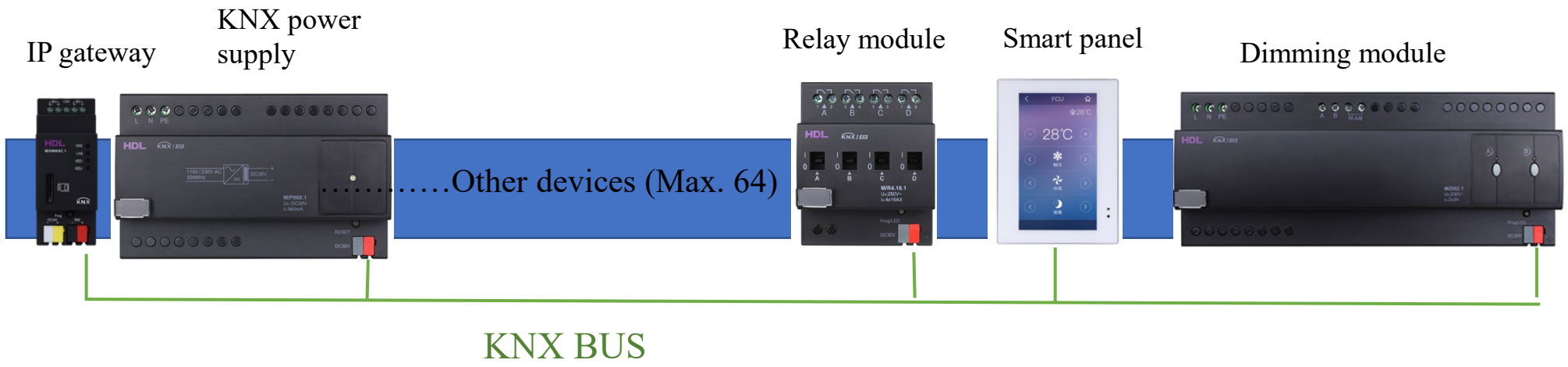
1. Expansion of the number of modules.

Other functions:

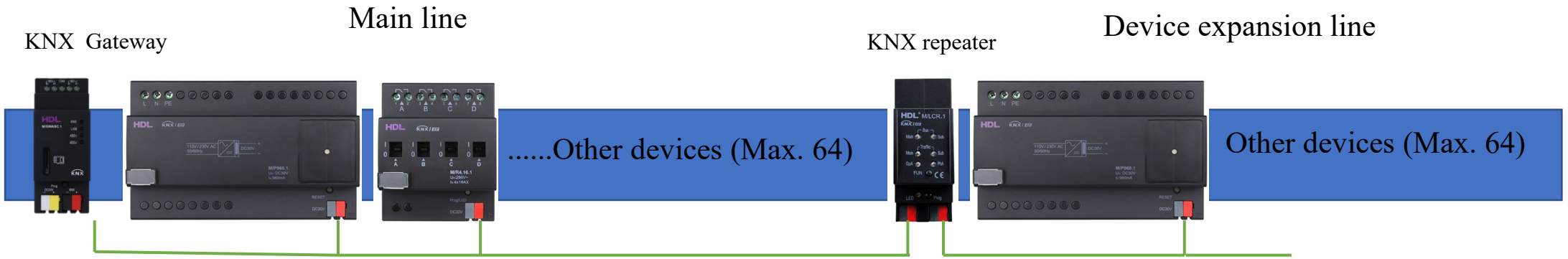
1. Enable KNX zone/line isolation.
2. Data filtering.

Topology composition:

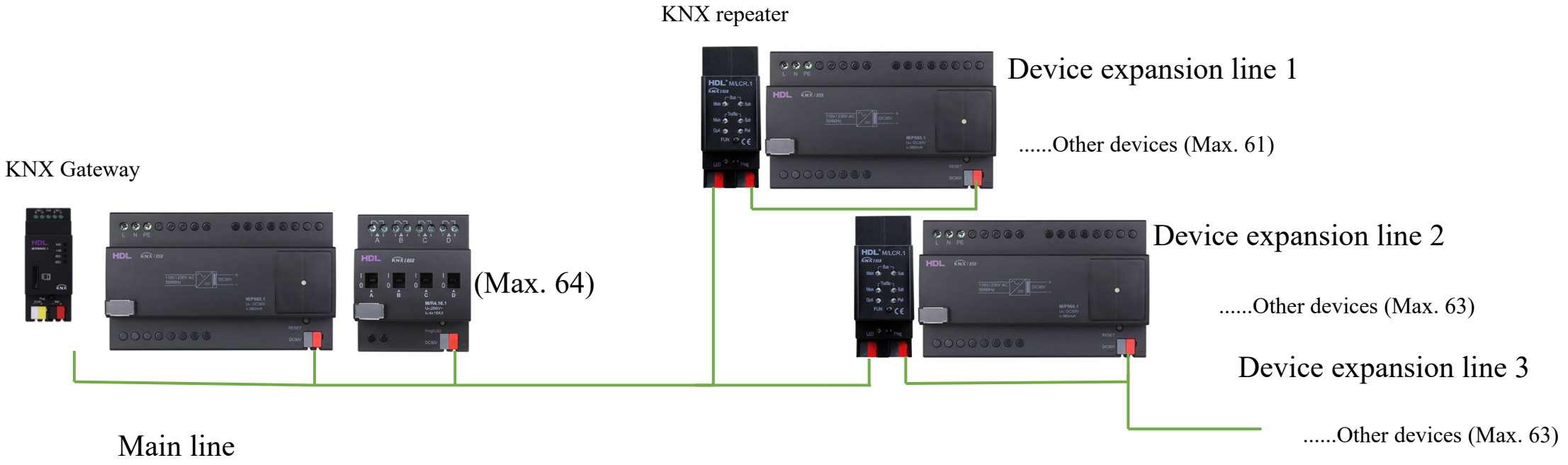
- Generally speaking, we can use a power module and KNX gateway to form the simplest KNX system, and this system can support up to 64 devices (excluding power supply).



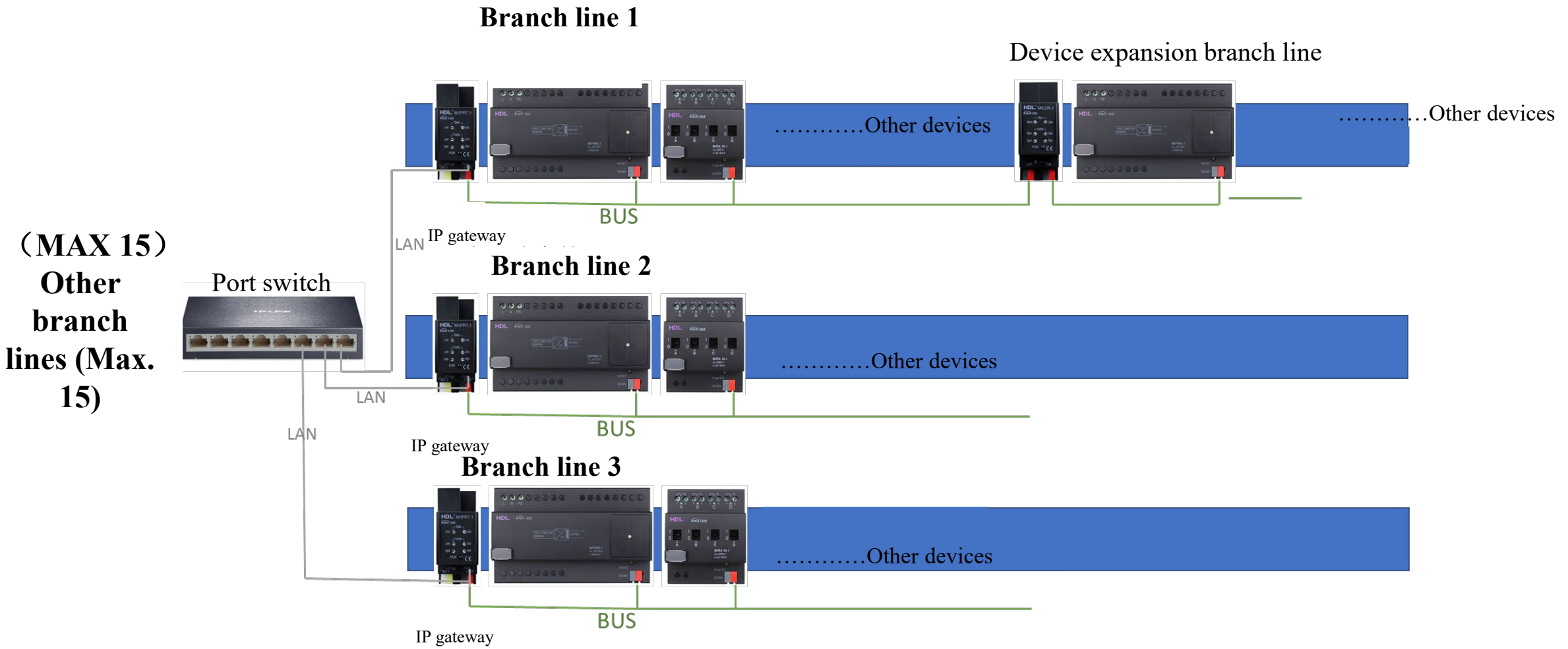
- Some systems may be even larger (more than 64 devices), so we can add power supply and repeater to expand the system based on the previous example.



- In the same way, we can expand the system with up to 3 repeaters, and the maximum number of devices supported in this way can reach 255.



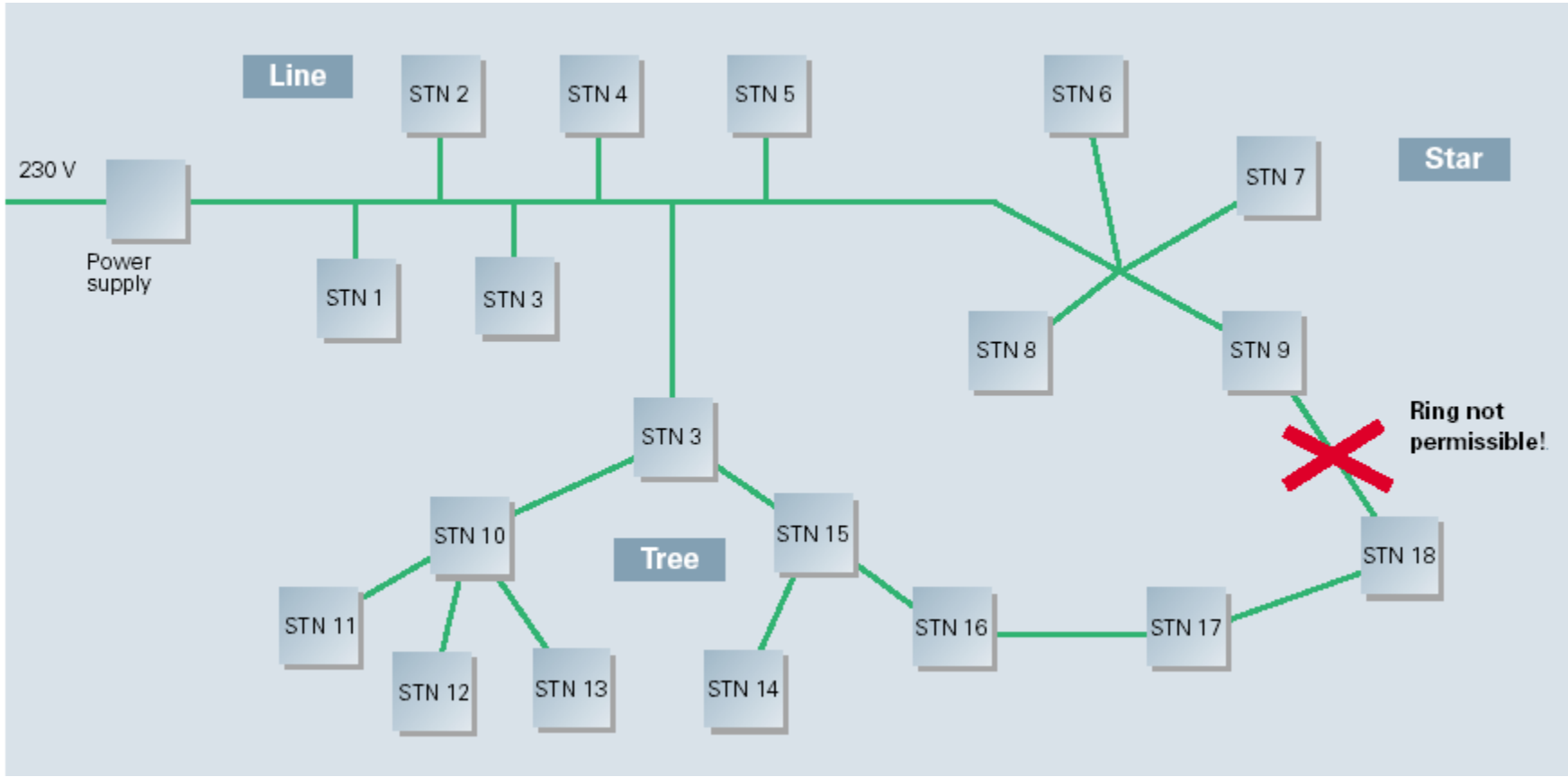
- When our system needs to be further expanded, we can connect IP routers of different branch lines together through switches.(Through IP routers, we can divide branch lines into 15 at most, and each branch line can support up to 255 devices).Under this system structure, we can support up to 15 X 255 KNX devices.



Distance supported by KNX cable

Cable length	Types of bus power			
	Number of distributed bus power supply devices			Central bus power supply unit (PSU)
	1	2	3 ... 8	
Maximum length of cable	350 m	700 m	1000 m	1,000 m
Maximum distance between two bus devices	350 m	700 m	700 m	700 m
Maximum distance between non-power supply device and power supply	350 m	350 m	350 m	350 m
Minimum distance between two power supply devices	There is no minimum cable distance between two power supply devices and a standard central power supply device.			As specified by the manufacturer

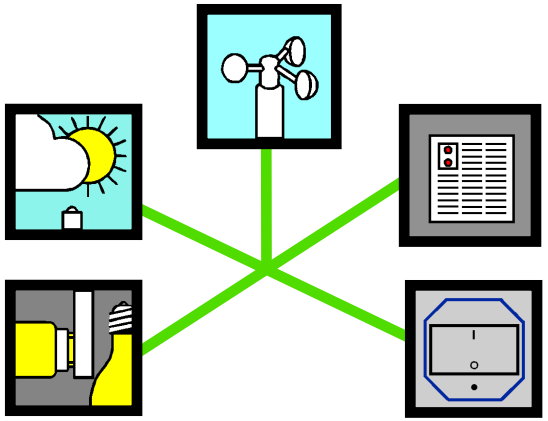
The ring network is not supported in KNX topology.

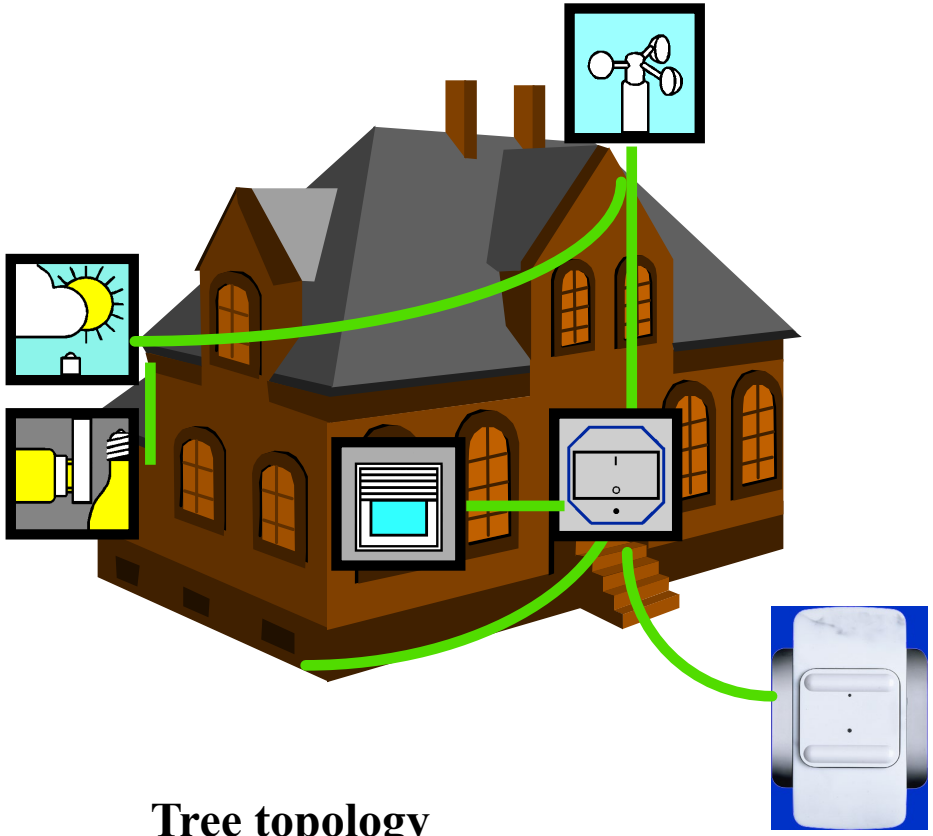


Common topology of KNX

Linear topology

Star topology

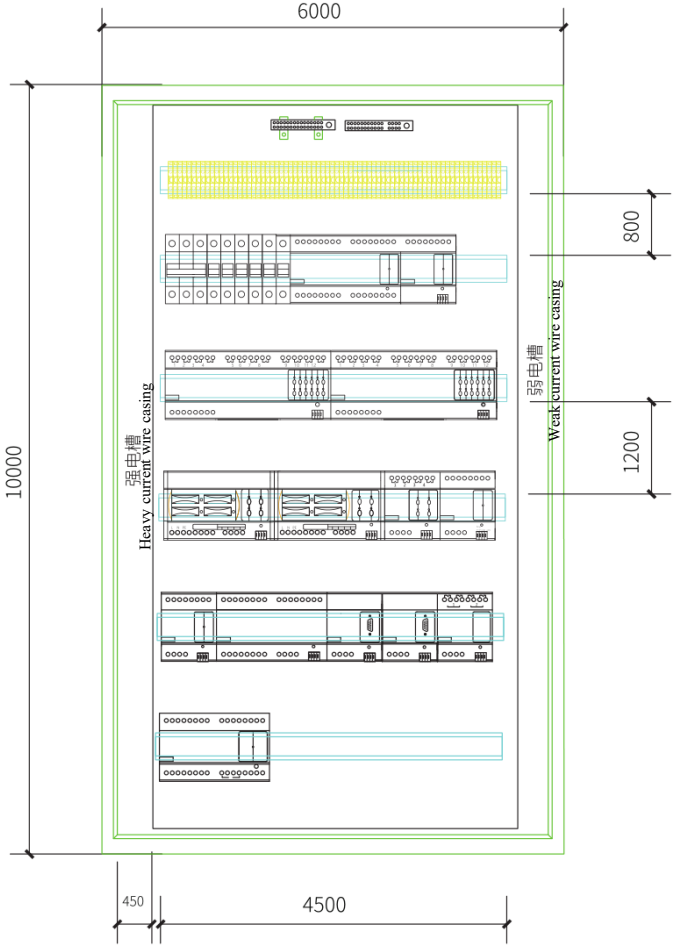




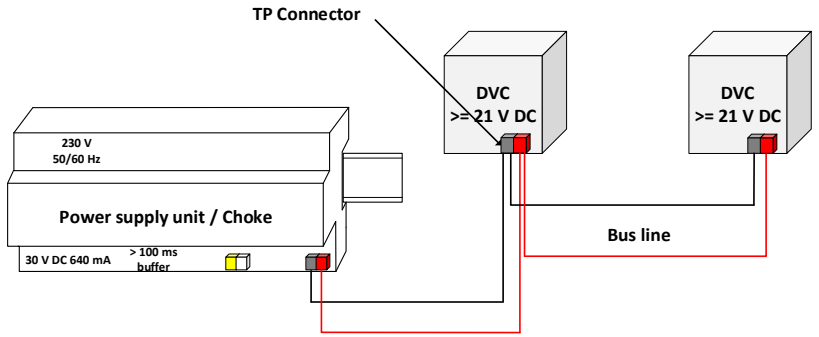
Tree topology

Modules are mounted on standard rails

(installed with the standardized distribution board (EN 50022 35x7.5 mm DIN).)



Examples of device connection



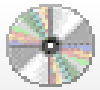
Concept of ETS

ETS (Engineering Tool Software) is designed for solution designers and installation engineers to plan, design and commission KNX system. ETS™ is a registered trademark of KNX. The current version is ETS5. Although ETS5 is a newly developed software, its interface is as similar as the previous version as possible.

ETS can only be downloaded from KNX online store (https://my.knx.org/en/shop.)
After downloading, please decompress and perform *ETS5Setup.exe* for installation.

The following operating systems are supported in principle:
MS Windows 7/8 x64/x32
MS Windows Server 2008/2012 x64

Current ETS sales system



Customer downloads ETS installation files

→ Demo → Customer orders via KNX Online Shop → customer Pays → customer gets final key + invoice + dongle

free installation files via personal online shop account	
▪ upon install	**Demo**
▪ upon receipt of payment	**Prof, Suppl or Lite (depending on key type)**

	All versions have bus access
Professional	Full functionality, no time limit
Demo	▪ Max. 5 devices
Supplementary	▪ Full functionality ▪ Intended for notebooks Max 2 licenses per Professional license
Lite (Students)	▪ Max. 20 devices

 = requires licence key