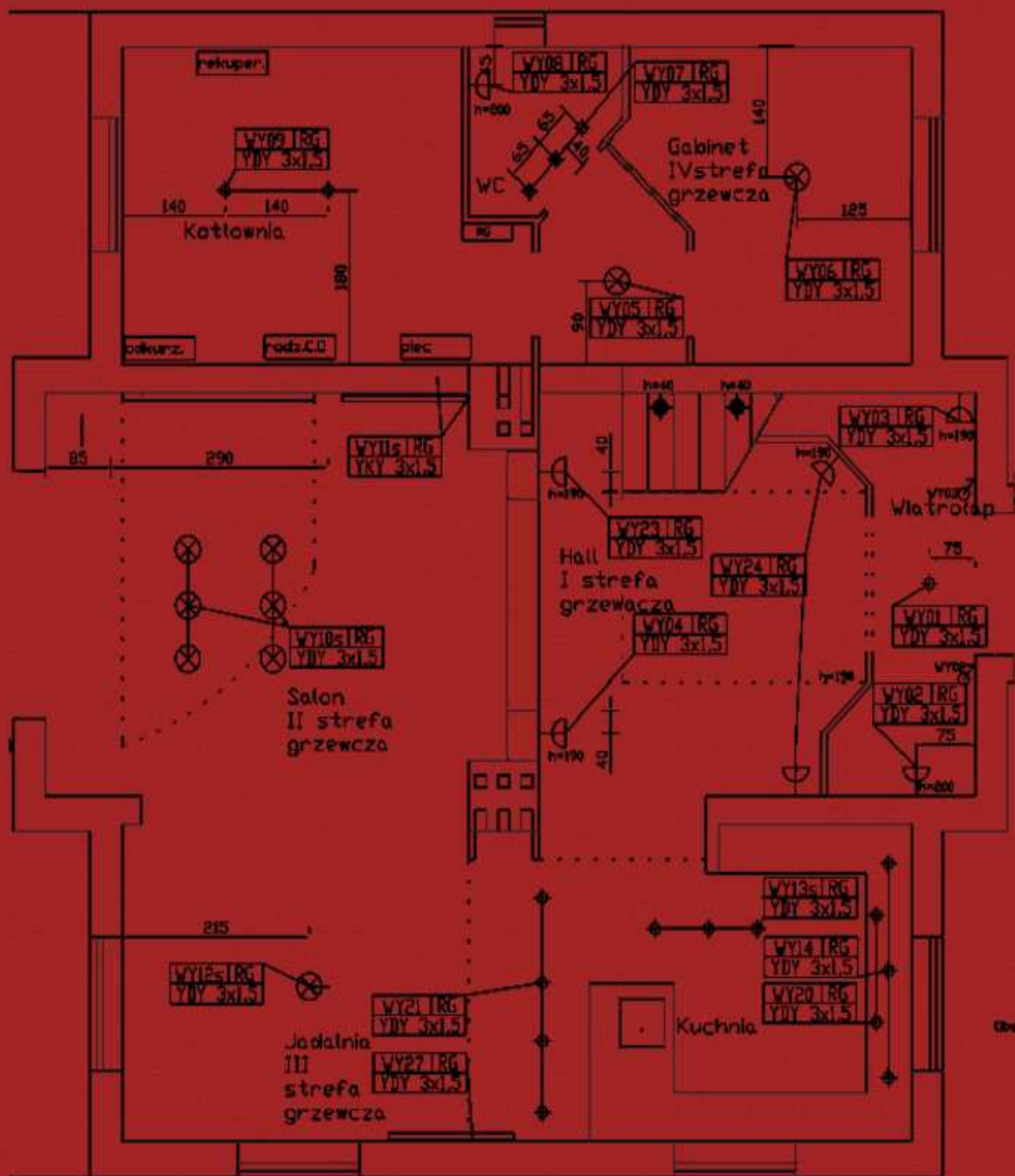


# How To Create KNX Design & Installation?



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## Fragment 1 – Designing a KNX installation

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### Scope of information required to create a design

- floor plans of all floors of the building, with marked electric outlets (lamps, wall outlets, window blinds, floor heating, etc.) and heating points (distribution units, radiators).
- description on the floor plans of the count (power), location and function of light sockets (on/off switching, dimming – also for compact fluorescent bulbs, transformer type for halogen bulbs)
- description of the number and location of each utility socket (230 V power, TV, phone, PC), and control points (consoles, thermostats, LCD panels, etc.)
- power supply points and designation of single- and three-phase equipment that need to be powered apart from typical outlets and light sockets (floor, mirror and driveway heating, fans, window blinds, etc.)
- installation height of switches and outlets (our suggestions are 1,2 m i 0,2 m)
- count and power consumption of three-phase powered equipment (stove, oven, ventilation, air-conditioning, pool equipment, outlets, etc.)
- possible installation points of electric and teletechnical distribution units (the distribution unit of the KNX system usually has dimensions of 100 x 200 x 25 cm)
- maximum dimensions of the spaces for distribution units (height, width, depth)
- type of cable laying technique in the building (immersed, surface-mounted, flush-mounted)
- power supply to the building (current and target)
- type of cable supplying power to the building (wire count and diameter)
- scope of other installations, and responsible entities (alarm system, TV network, phone network, computer network, etc.)
- contact details of the architect and persons dealing with power supply and control (pool automatic equipment, heating, air conditioning, window blinds, ventilation, gates)
- optionally, architectural plans in AutoCAD
- description of functions to be controlled by each consoles for correct choice of consoles and number of buttons.

## Fragment 2 - customer requirement questionnaire for the KNX system

<b>1. Basic power supply – please state number and location of outlets</b>		
1	Standard internal grounded outlets for ~230V (suggested installation height 0,2 or 0,3 m above floor).	
2	Watertight internal grounded outlets for ~230V (suggested installation in rooms prone to humidity – bathroom, garage).	
3	External grounded outlets for ~230V	
4	Three-phase outlets for ~400V (e. g. oven, sauna)	
5	Outlets to which lamps will be attached	
6	Outlets to which dangerous equipment will be attached (iron, kitchen food processor, grill etc.).	
<b>2. Dedicated power supply – please state number, location, and power consumption of the equipment</b>		
7	Computers, printers	
8	Electronic equipment: phone central unit, alarm system, entry phone	
9	Audio-video equipment	
10	Electric stove	
11	Kitchen vapour exhaust	
12	Electric oven	
13	Dishwasher	
14	Refrigerator, freezer	
15	Central vacuum cleaner	
16	Heating furnace	
17	Additional heating	
18	Water heater	
19	Water pump	
20	Washing machine, dryer	
21	Ventilator/recuperator	
22	Aquarium (filter, heater, lighting)	
<b>3. Emergency power supply</b>		
23	Local UPS – will it be installed at every computer unit?	
24	Central UPS – please state which circuits are to be protected against power interruptions.	
25	Emergency power generation unit	
<b>4. Automatic equipment – please state number of devices</b>		
26	Ventilators (i. e. toilet, bathroom, technical rooms)	
27	Feeders, drinking troughs, aquarium, others	

**Fragment 3 - Control consoles should be installed:**

- As a rule, in a room from which one may exit the house, i. e. vestibule, garage.
- At points from which one can control the largest number of circuits, i. e. the control console in the hall may also control the lighting in the wardrobe, toilet, heating plant or a closet.

**Motion detectors should be placed:**

- In passages, i. e. corridor, staircase; in the design, remember to install the sensor in a way providing it with the largest possible range, i. e. in a corner at the ceiling.
- In rooms that are used for short periods of time, i. e. heating plant, toilet, closet, pantry, etc.

## **Fragment 4 - Interim installation**

(adapted both for traditional solutions, and a future expansion into a KNX installation)

Below you will find a description how to create an installation adapted to the installation of traditional equipment today, and KNX equipment in the future, if the customer does not want to install them straight away i. e. for financial reasons.

### **Electric switch cabinets**

There should be at least one cabinet for each floor, and it should best be installed as centrally as possible. The size of the switch cabinet depends on the amount of automatic equipment of the KNX system. The switch cabinets on each floor can be flush-mounted, the type of the main cabinet depends upon many factors, i. e. its power rating, and whether it is to be equipped with ARS (Automatic Reserve Sharing). If the design should foresee only one switch cabinet, then all cables from that floor should run to that cabinet. All electric switch cabinets should be connected via the KNX bus cable.

### **Light circuits, window blind circuits, power outlets**

A power supply cable should run to each light point, directly from the switch cabinet (recommended cable - YDY 4x1,5 - for easy future expansion of the system). Run an independent YDY 4 x 1,5 cable from the nearest electric switch cabinet to each electric motor. Outlets that are not controlled should be grouped together, i. e. in groups of six. It's best to run the cable from outlet to outlet without additional connection points. For easy future expansion YDY 4 x 2,5 is recommended. For each outlet that you would like to control, run a separate cable from the electric switch cabinet.

### **Control points (switches, LCD panels, computer...)**

To the location of switches in the walls run an independent YDY 1,5 mm cable, wire count 2+number of light circuits to be controlled in that set of switches. Connection of the switch with the controlled circuit (lamp, outlet, or window blind) should be made at the switch cabinet to which both wires run. In order to reduce the length of cable required, one can, instead of a separate cable from the switch cabinet, run the cable going to the given lamp to the switch instead (as in traditional installations). These situations are shown in fig. 3 and fig. 4.

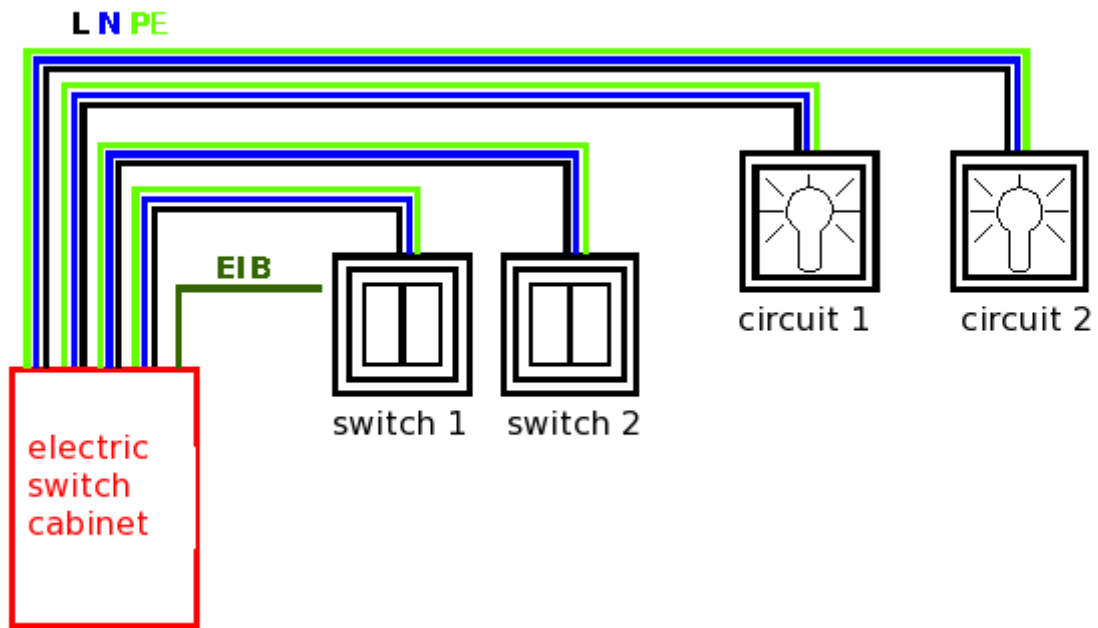


Fig. 3. Diagram of an interim installation (professional variant) on an example of two light circuits

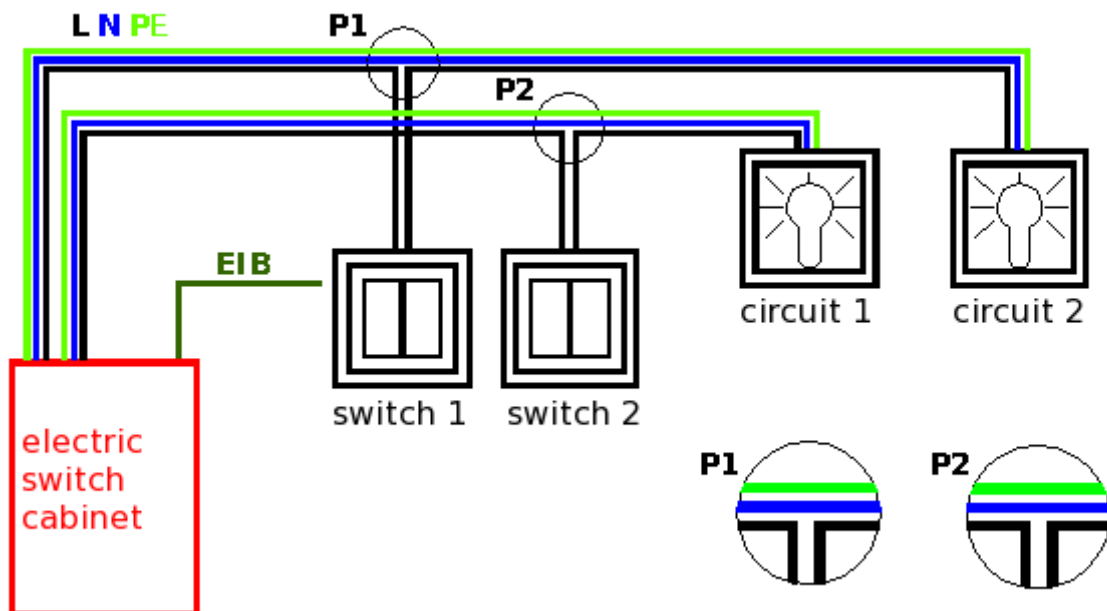
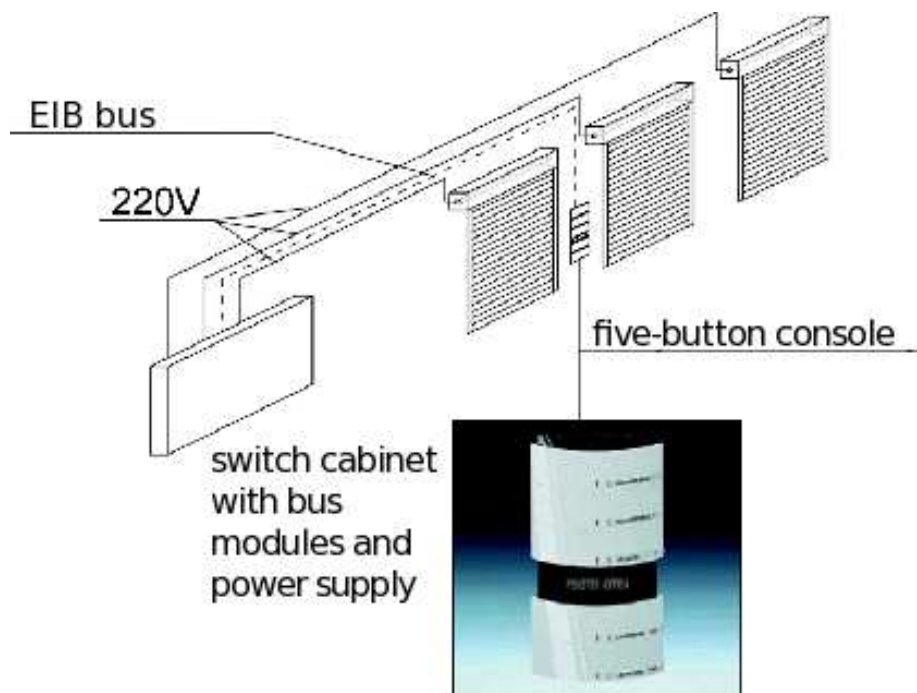


Fig. 4. Diagram of an interim installation (economy variant) on the example of two light circuits

### Fragment 5 - Example I for the Instabus KNX system

- run a separate cable from each blind to the switchboard
- from each planned switch, run the KNX bus cable to the switchboard (an individual four-wire cable can run from the switchboard to every switch one after another, in a series)
- at the switchboard, install the bus power supply and addressable controllers of the motors of the blinds. Connect to them via a cable the 24 V or 230 V blinds and the KNX bus cable running to the switch.
- install KNX switches in the junction boxes
- install the system software (programming denotes the determination which button of which console is supposed to control which blind or set of blinds)





## Fragment 6 – Control consoles

### 4. What are the types of available control consoles?

The KNX systems offers the comfort of free selection of the devices visible in the rooms (control consoles, motion detectors, LCD panels, etc.), so that they fit your needs and possibilities in terms of functionality and aesthetics. On our offer you will find products by world market leaders (among others by ABB, Berker, Gira, Hager, Jung, Merten), which warrants highest quality. Apart from standard, typical devices, our offer is constantly supplemented with new items following the most modern trends.

### 5. Which control consoles to choose?

First of all, one needs to determine, which functions should be implemented in them. Typical functions are (in brackets the number of buttons required by a specific function):

- switching of a lamp or outlet (1)
- switching of a lamp + light intensity adjustment (2)
- window blind (curtain rail) control, or control of a group (2)
- opening/closing of a gate, door, roof window (1)
- selection of a scene, switching on of a central function (1)
- OFF function - to turn of all lamps, i. e. when exiting the room or before a scene is selected (1)

#### ***Examples of scenes and central functions:***

- ***scenes:*** guests, cleaning, coffee break, film, reading, dinner party, cooking, dinner, date, sleep (turns off all lamps, rolls down the blinds, arms the alarm system), wake-up, alarm (turns on all outside lamps to scare the intruder away)
- ***when exiting the room*** - turns off all lights
- ***when exiting the house*** - turns of all lights, rolls down the blinds, decreases the heating
- ***when entering the room*** - turns on a few lamps, raises selected blinds, increases the temperature
- ***raising/lowering of all window blinds***
- ***switching of all external lamps*** - automatic start-up at dusk is also possible

## Other guidebooks by this author

### How to make your house intelligent? (an e-mail training course in 20 parts)

This is the only free publication on the market to gather all basic information about intelligent home systems in a reader-friendly guide form. The guide is targeted primarily at persons building or designing a house or flat, but also at specialists and designers who would like to get to know the basics or have them all together in one publication. The guide has over 160 pages and is distributed via e-mail in 20 parts (with the option of downloading it in whole). You can read more and sign in at [www.smarthome.eu/general-guide](http://www.smarthome.eu/general-guide)

### How not to forget that one little cable?

Do you know that forgetting one little cable can cause you to break down your walls again and cause the family to complain that you weren't diligent enough to read the list of over 200 cables that you need to account for when designing the installation for your house? Learn more about this guide and order it at [www.smarthome.eu/order-cables-guide](http://www.smarthome.eu/order-cables-guide)

### How to create a KNX design and installation?

Installation specialists and smart home system designers often seek answers to these and many related questions regarding the design and implementation of KNX systems. Browsing hundreds of pages of general material is time-consuming and ineffective. This, however, can be avoided. Learn more about this guide and order it at [www.smarthome.eu/order-design-guide](http://www.smarthome.eu/order-design-guide)

### How To Pick And Choose KNX Equipment?

There are already over 10000 devices for the KNX system on the market, offered by over 400 manufacturers. How to handle such a mass? How to select the right device to suit user requirements? From among over 10000 devices, this guide contains on over one hundred pages descriptions and/or photos of over 250 of the most important or most interesting devices and their uses, including a handful of practical tips. Learn more about this guide and order it at [www.smarthome.eu/order-units-guide](http://www.smarthome.eu/order-units-guide)

### How to build an electric switch cabinet for the KNX system?

Step by step we will guide you through the process of assembly and construction of large electric switch cabinets. We will also tell you what you definitely cannot forget, and where you should take particular care. Learn more about this guide and order it at [www.smarthome.eu/order-cabinet-guide](http://www.smarthome.eu/order-cabinet-guide)

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### Installations - document templates

Templates of documents, designed by experts from SMARTech in consultation with lawyers. Apart from a contract draft for the execution of an installation, available are, among others, commissioning protocols, system verification documents, even calls for payment. Learn more about this guide and purchase it at [www.smarthome.eu/order-documents-guide](http://www.smarthome.eu/order-documents-guide)

### KNX system - the set of guidebooks

All guidebooks above in one set you can buy with 30% discount. Learn more about this guide and purchase it at [www.smarthome.eu/knx-system-the-set-of-guidebooks](http://www.smarthome.eu/knx-system-the-set-of-guidebooks)

### A KNX system design for a house of 200 sq m

Based on this design you will learn how to execute other smart home designs and installations. The smart electric installation on its own (the design includes others as well) for a house of 200 sq m contains 171 modules in the switch cabinet, 130 cables running from the cabinet to the building, and several thousand connections. An experienced designer needs about 112 hours of work to create such a design. The time and money saved through the use of ready elements - this would be enough to calmly recommend the smart system design specifically to you. Learn more about this design and order it at [www.smarthome.eu/order-plans-pdf](http://www.smarthome.eu/order-plans-pdf)

### KNX system design - ETS files

Thanks to this, you can implement changes and load ready programmes to devices according to your system within a few hours. You can be certain that everything will work correctly. This set consist ETS database and project files and list of functions implemented in typical 200m2 house. Learn more about this design and order it at [www.smarthome.eu/order-plans-ets](http://www.smarthome.eu/order-plans-ets)