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The Ultimate Guide
to KNX Programming

A simple and easy to understand tutorial on KNX and ETS 5

Suitable for Beginner, Intermediate and Advanced Users

- Electricians
- Builders
- Heating Installers
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How much does KNX cost?

In short: there is no exact price for KNX, it depends on the installation.

The cost of KNX in a single-family house depends on a variety of factors. At the top of the list are personal and individual wishes. But other factors, such as the region, the possibilities and willingness to do some of the work yourself generally make a KNX calculation difficult.

To provide at least a short overview, I can share a few experiences from my many years of working with KNX. I can also give you a few additional tips on how to best find “your price”.

The biggest mistake
The biggest mistake that almost everyone interested in KNX makes, is approaching their personal wishes from the wrong perspective.

First, they find out what’s available, then they consider what options there are for application. Before they know it they are trying to imagine a complete KNX system.

That is – in my opinion – completely the wrong approach and you’re not doing yourself any favors. The rude awakening will inevitably come: everything is more expensive than you initially thought.

In my experience with KNX (since 1996), few people realise everything directly. Only once in all these years could a KNX user fulfill all their wishes. Once!

All the others were always forced to scale back their demands. Be smarter and follow your KNX planning using the right approach.

The Path to KNX planning
To create a sensible KNX plan, as quickly as possible, do not start with what’s available and what the result will be. You will have to make a plan, think modest, and summarise what you need for the project. Don’t overdo it or the costs may get very high!

It is important to ask yourself 3 basic questions. The first important question is:

1. What would I have at this point if I did not install KNX?
2. How much is my KNX installation allowed to cost in total?
3. What can I get on my available budget?
1. “What would I have at this point if I did not install KNX there?”

This question brings you back to reality very quickly. An example: Consider the basement. What kind of electrical installation would you have if you didn’t install KNX? Presumably, every basement room would only have

- 1 ceiling light
- 1 simple light switch
- a few power sockets
- possibly 1 room temperature controller

That would have been it! For a conventional electrical installation with KNX, per room only the following would be necessary.

- 1 switching channel (for the ceiling light)
- 1 input to a universal interface (for the actual switch)
- The heating remains conventional

An ordinary “average house” usually has the following rooms in the basement.

- Hallway/staircase
- Boiler room
- Laundry room
- Storage room
- Hobby cellar

Together, this would be 5 separate lights to switch (= 5 actuator channels) and therefore 5 separate KNX functions to control.

**KNX Hardware Requirements:**

5 channels of a switch actuator and 5 inputs to a universal interface.

**KNX Costs:**

An 8-fold actuator costs around 200.00 GBP (NET prices!!!). 200 divided by 8 = 25.00 GBP.

5 channels times 25.00 = 125.00 GBP

The 5 inputs for all switches in the basement can be covered with a single 8-fold universal interface (and there are even 3 inputs still free).

1 universal 8-fold interface costs around 125.00 GBP. 125.00 + 125.00 = 250.00 GBP

250.00 GBP and the whole basement is KNX-capable! (at least for the light)

That’s not too expensive, is it?
Right, but in 99% of all cases it is not planned this way. The question is not asked...

"What would I have at this point, if I did not install KNX here?"

... instead, we “dream”. And build unrealistic expectations.

As soon as someone interested in KNX has caught KNX fever, they obviously think differently. Suddenly, the original basement room with...

- 1 ceiling light
- 1 simple light switch
- a few sockets
- possibly 1 room temperature controller

... turns into a luxury cellar that might look like this in a KNX dream:

- 1 ceiling light (maybe even dimmable)
- 1 decorative light switch, meaning a (more expensive) touch sensor
- several sockets
- 1 lock contact on each window
- 1 KNX room temperature regulator (+ heating channel)

Let’s just calculate this one room.

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
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<tbody>
<tr>
<td>1 dimming channel</td>
<td>65.00 GBP</td>
</tr>
<tr>
<td>1 FM bus coupler</td>
<td>85.00 GBP</td>
</tr>
<tr>
<td>1 1-fold touch sensor</td>
<td>50.00 GBP</td>
</tr>
<tr>
<td>Additional charge for sockets</td>
<td>150.00 GBP</td>
</tr>
<tr>
<td>2 shutter contacts</td>
<td>50.00 GBP</td>
</tr>
<tr>
<td>1 universal 2-fold interface (for Windows)</td>
<td>50.00 GBP</td>
</tr>
<tr>
<td>1 room temperature controller</td>
<td>250.00 GBP</td>
</tr>
<tr>
<td>1 FM bus coupler for room temperature</td>
<td>85.00 GBP</td>
</tr>
<tr>
<td>Additional commissioning</td>
<td>150.00 GBP</td>
</tr>
</tbody>
</table>

Total 935.00 GBP for this room alone!!!

With this approach you can easily burn 5000.00 GBP for KNX in the basement alone. On other floors, there are rooms with more windows and even higher demands for comfort, which then multiplies the cost again.

This example is certainly somewhat exaggerated, but it illustrates the “KNX problem” very well.
My advice: Always ask yourself the question, what would I have at this point if I didn’t install KNX here?

The second important question is:

2. How much is my KNX installation allowed to cost in total?

This will give you the answer to your question “how much does a KNX installation cost?” Set a limit to how much your KNX installation may cost.

If you have no reserves to allow increasing the amount of money spent if necessary, commit to this limit! Write this amount down and start planning.

Now consider the third question about KNX:

3. What can I get on my available budget?

Now that you have found the amount you are willing to pay for KNX, you can deal with the realistic possibilities. There is certainly a lot on the market for every budget. Remember, KNX doesn’t have to be expensive! In Chapter 3 of this course I will show you how to determine the number of components you need!
The way to calculate the price of the KNX system

1. Use the Excel spreadsheet provided to determine your material and KNX requirements!

<table>
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</table>
2. Calculate the KNX material required!

If you arrive at 50 to 60 KNX devices, one line is sufficient. For the system configuration, you need...

- 1 power supply, 640 mA
- 1 KNX interface (USB or IP)

If you come to a total of 60 to 120 devices, you'll need the following for the system configuration:

- 1 power supply 320 mA for the main line
- 1 KNX interface (USB or IP)
- 2 power supplies 640 mA for lines 1 and 2
- 2 line couplers

If you come to a total of 120 to 170 devices, you’ll need the following for the system configuration:

- 1 power supply 320mA for the main line
- 1 KNX interface (USB or IP)
- 3 power supplies 640 mA for lines 1 and 2 and 3
- 3 line couplers
At the end of this chapter I will present in detail the possibilities for building up topologies of varying complexity.

**What counts as a KNX device?**
A KNX device is e.g. a KNX actuator, a KNX sensor, a KNX weather station, etc. Each KNX device has its own KNX connection terminal. The number of inputs or outputs is irrelevant. Therefore, a switching actuator 20-fold or a push-button 8-fold count both as only "one" KNX device.

3. *Calculate until you reach “your price”*
Always keep an eye on your budget when calculating! I hope these tips will help you a little!
Get the ebook

This PDF is an extract from our ebook “The Ultimate Guide to KNX Programming” which is available online at https://www.knxtutorial.com.

It is a simple and easy to understand tutorial on KNX and ETS 5 and gives you an introduction to the world of KNX technology. The course is designed to teach absolute beginners KNX and ETS and contains the following information:

From setting up a miniature system to systems with several areas, you will learn the correct cabling and procedures.

You will receive a detailed introduction to the ETS Tool Software version 5 - from licensing to installation, commissioning and an explanation of all essential functions.

The Ultimate Guide to KNX Programming guides you step-by-step through a project from A to Z laying out all the necessary steps in an easy to understand, practical way

- the necessary planning of a project
- the preparation of the actuators and sensors
- the detailed explanation of commissioning
- programming, final inspection and acceptance

This is the English version of the bestselling ebook that has been available since 2004!
If you are an electrician and are interested in an official KNX certification, this course is the ideal way to prepare for the optional certification courses.

KNX certification allows you to use the KNX partner logo in your own marketing activities (e.g. stationery, cars). In addition, you will be listed as an official partner of the KNX Association (knx.org). These two advantages are a reason for many of our customers to get certified. The content of this ebook is adapted to the KNX basic course and the corresponding certification programme.

Furthermore, the products presented and used in the ebook are very often used in the certification courses, so that you feel ‘at home’ with the products. This tutorial is therefore an ideal preparation for the certification seminar. However, certification is not a prerequisite for realising KNX projects. We, therefore, recommend everyone to gain practical experience in projects as quickly as possible.

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