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# KNX Training

Requirements for KNX Training Centres



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## 1 Definitions

Term	Explanation
<b>KNX certified training centre:</b>	training centre that is accredited by KNX Association for the organization of <i>KNX Basic courses or Condensed Practical Basic course</i>
<b>KNX+ certified training centre:</b>	training centre that is accredited by KNX Association for the organization of <i>KNX Basic courses as well as KNX Advanced courses.</i>
<b>KNX HVAC 'Specialist' certified training centre:</b>	training centre that is accredited by KNX Association for the organization of <i>KNX Basic courses and KNX HVAC Specialist courses</i>
<b>KNX++ certified training centre:</b>	training centre that is accredited for the organization of <i>KNX Basic courses, KNX Advanced courses as well as KNX Tutor courses.</i>
<b>KNX course:</b>	can be a Basic course, Advanced course, KNX HVAC Specialist course, Tutor course or Refresher course with or without theoretical and/or practical exam. The course can be given online <sup>1</sup> or on-site (F2F → face to face). F2F courses can be taken at the premises of the training centre or if mobile training rigs are used at the premises of the customer(s)
<b>KNX Preparatory course for Basic or Advanced course</b>	Is an <b>uncertified</b> online Basic or Advanced course
<b>KNX Virtual</b>	KNX Virtual is an application that can be run on a Windows computer. KNX Virtual graphically represents a set of KNX devices. By using the ETS together with KNX Virtual, it is possible to simulate e.g., a light being switched on/off, a shutter being moved up/down etc.
<b>KNX Training documentation:</b>	can be Basic, Advanced, HVAC Specialist, Tutor or Refresher course documentation
<b>Self-educated person:</b>	person who can prove many years of theoretical and/or practical experience with KNX or ETS.
<b>MyKNX:</b>	tailor-made Web tool from KNX Association for various target groups like ETS licensees, KNX members, KNX training centres, KNX Partners... ( <a href="https://my.knx.org">https://my.knx.org</a> )

<sup>1</sup> For requirements of online courses see 2.2

## 2 Introduction

It is indispensable that a KNX installation is properly programmed and commissioned by skillful personnel. KNX Association has therefore drawn up training measures to inform about:

- selection of bus devices and installation material;
- fields of application and main applications of the KNX bus system;
- selection of the bus topology in view of the construction of the building and the desired functionalities;
- planning of the to be installed bus system;
- installation, thereby considering the relevant regulations (e.g., lightning protection, electromagnetic compatibility, etc.);
- commissioning and servicing of KNX installations.

## 2.1 Types of KNX courses

### 2.1.1 KNX Basic course

The KNX Basic course is the first course that a newcomer must attend in order to become a KNX Partner and in order to be listed as a KNX Partner on the KNX website. The course consists of a theoretical and a practical part which shall be organized F2F or online<sup>2</sup> (see below table for more information). Mobile or fixed training rigs are used to convey the practical part of the course.

The following topics shall be conveyed during the organization of a KNX Basic course:

	No.	Topic	Location	Number of hours	
Practical	1	ETS Project Design: Basic	F2F	6h	Minimum 50 % of total course duration
	2	ETS Project Design: Advanced (only for informative purposes)	F2F	-	
	3	ETS Commissioning	F2F	6h	
	4	ETS Diagnostics	F2F	3h	
Theoretical	5	System arguments	F2F / Online	30 min.	Recommended number of hours
	6	System overview	F2F / Online	3h	
	7	TP Topology	F2F / Online	3h	
	8	Bus devices	F2F / Online	1h, 30 min.	
	9	RF	F2F / Online	1h	
	10	TP Installation	F2F / Online	3h	
Exam	11	Theoretical exam	F2F	1h, 30 min.	Compulsory number of hours
	12	Practical exam	F2F	1h, 30 min.	
				<b>30 hours (4 to 5 days)</b>	

<sup>2</sup> For requirements of online courses check 2.2

### 2.1.1.1 Requirements with regard to the KNX Basic course

- The duration of the total course incl. exams is at least 30 hours;
- The student must attend the course at least 75 % of the total course duration;
- All topics of the KNX Basic course documentation shall be dealt within the above-mentioned period of time;
- Theoretical as well as practical part shall be conveyed by a KNX certified tutor;
- The theoretical and practical exam shall always be organized F2F in the presence of a KNX tutor.
- One KNX tutor shall be available for every 16 students during practical classes;
- The proportion of practical classes shall be at least 50 % of the entire course duration;
- Student must pass the theoretical as well as the practical exam with minimum 50 % of the marks (See <https://support.knx.org/hc/en-us/sections/360005610620-Exam-management> for exam regulations).

### 2.1.2 KNX Condensed practical Basic course<sup>3</sup>

This type of course is intended for the KNX **self-educated persons** or for those who have followed a full Preparatory Basic course. Students who attend this Condensed practical Basic course and succeed in both exams can also become a KNX Partner.

The following topics shall be conveyed during the organization of a KNX Condensed practical Basic course:

	No.	Topic	Location	Number of hours	
Practical	1	ETS Project Design: Basic	F2F	4h	Compulsory number of hours
	2	ETS Project Design: Advanced (only for informative purposes)	F2F	-	
	3	ETS Commissioning	F2F	5h	
	4	ETS Diagnostics	F2F	3h	
Exam	5	Theoretical exam	F2F	1h, 30 min.	
	6	Practical exam	F2F	1h, 30 min.	
				<b>15 hours (2 days)</b>	

<sup>3</sup> The KNX Condensed practical Basic course has been reduced to 8h until further notice.

### 2.1.2.1 Requirements with regard to KNX Condensed practical Basic course

- The duration of the total course incl. exams is at least 15 hours;
- The student must attend the course at least 75 % of the total course duration;
- All chapters with regard to practical training (i.e., KNX Project Design, Commissioning, Diagnostics) of the KNX Basic course documentation shall be dealt within the above-mentioned period of time;
- Practical part shall be conveyed by a KNX certified tutor;
- One KNX tutor shall be available for every 16 students during practical classes;
- The practical part of the course as well as the exams shall always be organized F2F in the presence of a KNX tutor.
- Student must pass the theoretical as well as the practical exam with minimum 60 %<sup>4</sup> of the marks (See <https://support.knx.org/hc/en-us/sections/360005610620-Exam-management> for exam regulations).

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<sup>4</sup> The pass rate for this course is 50 % until further notice



### 2.1.3 KNX Advanced Course

Training Centres that want to take their courses to the next level have the possibility to also offer KNX Advanced courses. The theoretical and practical part of the course is organized either F2F or online<sup>5</sup> (see below table for more information). Mobile or fixed training rigs are used to convey the practical part of the course. The following topics shall be conveyed during the organization of a KNX Advanced course:

	No.	Topic	Location	Number of hours	
Theoretical	1	Fail-safe planning <i>(only for informative purposes)</i>	F2F / Online	-	Recommended number of hours
	2	Flags	F2F / Online	2h	
	3	Interworking	F2F / Online	2h	
	4	KNX Telegram	F2F / Online	2h	
	5	ETS Apps <i>(only for informative purposes)</i>	F2F / Online	-	
	6	KNX and Multimedia <i>(only for informative purposes)</i>	F2F / Online	-	
	7	KNX and Smart Metering/Smart Grid <i>(only for informative purposes)</i>	F2F / Online	-	
Practical	8	KNX Secure	F2F	2h	
	9	HVAC control with KNX	F2F	4h	
	10	Couplers	F2F	4h	
	11	IP Communication	F2F	2h	
	12	Lighting control	F2F	3h	
	13	Security technology	F2F	1h	
	14	Logic operations	F2F	2h	
	15	Visualization Systems	F2F	3h, 30 min.	
Exam	16	Theoretical exam	F2F	30 min.	Compulsory number of hours
	17	Practical exam	F2F	2h	
				<b>30 hours (4 to 5 days)</b>	

<sup>5</sup> For requirements of online courses check 2.2

### 2.1.3.1 Requirements with regard to the KNX Advanced course

- The duration of the course is at least 30 hours;
- The student must attend at least 75 % of the total course duration;
- Student must pass the Basic course exam in advance in order to attend the KNX Advanced course;
- All topics of the KNX Advanced course documentation shall be dealt within the above-mentioned period of time;
- Theoretical as well as practical part shall be conveyed by a KNX certified tutor;
- The theoretical and practical exam shall always be organized F2F in the presence of a KNX tutor.
- One KNX tutor shall be available for every 16 students during practical classes;
- The proportion of practical classes shall be at least 50 % of the entire course duration; Student must pass the theoretical and the practical exam (error finding, telegram/device analysis, project design) with minimum 50 % of the marks (See <https://support.knx.org/hc/en-us/sections/360005610620-Exam-management> for exam regulations).

### 2.1.4 KNX Condensed Practical Advanced course<sup>6</sup>

This type of course is intended for KNX partners who have along their career gained deeper KNX knowledge or for those who have followed a full Preparatory Advanced course. The practical part of the course is organized F2F (see below table for more information). Mobile or fixed training rigs are used to convey the practical part of the course. The theoretical and practical exam is always organized F2F in the presence of a KNX tutor.

The following topics shall be conveyed during the organization of a KNX Condensed Practical Advanced course:

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<sup>6</sup> The KNX Condensed practical Advanced course has been reduced to 8h until further notice.

	No.	Topic	Location	Number of hours
Practical	1	KNX Secure	F2F	1h
	2	HVAC control with KNX	F2F	2h
	3	Couplers	F2F	2h
	4	IP Communication	F2F	2h
	5	Lighting control	F2F	2h
	6	Security technology	F2F	1h
	7	Logic operations	F2F	1h
	8	Visualization Systems	F2F	1h, 30 min.
Exam	9	Theoretical exam	F2F	30 min.
	10	Practical exam	F2F	2h
				<b>15 hours (2 days)</b>

#### 2.1.4.1 Requirements with regard to Condensed practical KNX Advanced course

- The duration of the course including the exam is at least 15 hours;
- The student must attend at least 75 % of the total course duration;
- Student must pass the Basic course exam in advance in order to attend the KNX Condensed Practical Advanced course;
- All topics of the Condensed Practical Advanced course shall be dealt within the above-mentioned period of time;
- Practical part shall be conveyed by a KNX certified tutor;
- The theoretical and practical exam is always organized F2F in the presence of a KNX tutor.
- One KNX tutor shall be available for every 16 students during practical classes;
- Student must pass the theoretical and practical exam (error finding, telegram/device analysis, project design) with minimum 60 %<sup>7</sup> of the marks (See <https://support.knx.org/hc/en-us/sections/360005610620-Exam-management> for exam regulations).

<sup>7</sup> Pass rate is 50 % until further notice

### 2.1.5 KNX HVAC Specialist Course<sup>8</sup>

KNX Professionals installing KNX devices that have an impact on the proper functioning of HVAC components (mostly installed by a different company/person), must have sufficient HVAC knowledge (various technical terms and their implications) to be able to properly coordinate work with the company that installed the HVAC components.

The ultimate goal of the KNX HVAC Specialist course is:

- lowering the communication barrier with the heating/cooling engineer
- to explain important technical terms with regard to HVAC components
- to promote the KNX technology also in the HVAC market segment

The theoretical and practical part of the course is organized either F2F or online<sup>9</sup> (see below table for more information)

The following topics shall be conveyed during the organization of a KNX HVAC Specialist course:

	No.	Topic	Location	Number of hours	
Theory and/or practical	1	Basic Know-How	F2F / Online	1h 40 min.	Recommended number of hours
	2	Heat distribution systems	F2F / Online	1h	
	3	Heat generators	F2F / Online	1h	
	4	Legal framework	F2F / Online	30 min.	
	5	To understand "Steering and adjustment"	F2F / Online	2h	
	6	Heating control	F2F / Online	1h	
	7	Drinking water	F2F / Online	30 min.	
	8	Energy efficiency with KNX	F2F / Online	4h	
Exam	9	KNX Theoretical exam	F2F	20 min.	Compulsory number of hours
				<b>12 hours (2 days)</b>	

<sup>8</sup> The chapter HVAC from the advanced course (4h) contains valuable information but is not enough to have a complete understanding of HVAC

<sup>9</sup> For requirements of online courses check 2.2

### 2.1.5.1 Requirements with regard to the KNX HVAC Specialist course

- The duration of the course shall be at least 12 hours;
- Student must pass the Basic course exam in advance in order to be admitted to the KNX HVAC Specialist course;
- All topics of the KNX HVAC Specialist course documentation shall be dealt with in the above-mentioned period of time;
- Theoretical as well as practical part shall be conveyed by a KNX certified tutor;
- One KNX tutor shall be available for every 16 students during practical classes;
- **The proportion of practical classes shall be at least 50 % of the entire course duration;**
- Student must pass the theoretical exam with minimum 50 % of the marks (See <https://support.knx.org/hc/en-us/sections/360005610620-Exam-management> for exam regulations).



***A KNX training centre is not allowed to only offer KNX HVAC Specialist courses. An application for a KNX Basic course is a prerequisite.***

### 2.1.6 KNX Tutor Course

KNX Tutor courses are offered for those students who want to start up a certified KNX training centre themselves or who want work as a KNX tutor at an already certified KNX training centre. The theoretical part of the course is organized either F2F or online<sup>10</sup>. The theoretical exam is always organized F2F in the presence of a KNX tutor.



***A KNX training centre is not allowed to only offer KNX Tutor courses. An application for a KNX Basic course as well as a KNX Advanced course is a prerequisite. The training centre needs to have trained 50 students for the Basic course and 25 students for the Advanced course before it can submit an application for becoming a KNX++ training centre***

The following topics shall be conveyed during the organization of KNX Tutor courses:

	No.	Topic	Location	Number of hours	
Theoretical	1	KNX Requirements for Training centres	F2F / Online	1h	Recommended number of hours
	2	Structure and Scope of KNX Association	F2F / Online	1h	
	3	KNX Software	F2F / Online	30 min.	
	4	History of Bus systems	F2F / Online	1h	
	5	Serial Data Transmission & KNX Protocol	F2F / Online	5h	
	6	Microcontrollers	F2F / Online	4h	
	7	Application program	F2F / Online	2h	
	8	KNX Certification Scheme for products	F2F / Online	1h	
Exam	9	Theoretical exam	F2F	2h 30 min.	Compulsory number of hours
				<b>18 hours (3 days)</b>	

<sup>10</sup> For requirements of online courses check 2.2

### 2.1.6.1 Requirements with regard to the KNX Tutor course

- The duration of the course is at least 18 hours;
- Student must pass the Advanced course exam in advance in order to be admitted to the KNX Tutor course. It is recommended that the Advanced qualification is acquired a maximum of two years before participating to the Tutor course;
- All topics of the KNX Tutor course documentation shall be dealt with in the above-mentioned period of time;
- **Theoretical part of the course shall be conveyed by a KNX tutor who himself has passed his tutor exam with an overall mark of 80 %;**
- The theoretical exam shall be organized F2F in the presence of a KNX tutor;
- Student must pass the theoretical exam with minimum 60 % of the marks (See <https://support.knx.org/hc/en-us/sections/360005610620-Exam-management> for exam regulations).



***The KNX Tutor course does not include pedagogical or didactical training. The course also does not include marketing-related training.***



***In order to prepare the course participants, the Tutor course documentation must be sent at least 2 weeks prior to the KNX Tutor course.***

### 2.1.7 KNX Refresher Course

A KNX Refresher course is a course that targets KNX partners who have followed the Basic course in the past. The goal of this course is to give all KNX partners the opportunity to **refresh** and develop their KNX skills further by informing them about the most recent KNX system and tools novelties. The **KNX Refresher courses can be fully given F2F or fully online<sup>11</sup> provided that the presence of the student can be checked via a real-time video-stream of the student.** There is no exam for the Refresher course. The KNX tutor only needs to confirm the presence of the student right after the course.



***A KNX training centre is not allowed to only offer KNX Refresher courses. An application for a KNX Basic course is a prerequisite.***

The following topics shall be conveyed during the organization of a KNX Refresher course:

	No.	Topic	Location	Number of hours	
Practical	1	Project Design ETS: Basic	F2F / Online	2h	Recommended number of hours
	2	Project Design ETS: Advanced <i>(only for informative purposes)</i>	F2F / Online	-	
	3	Commissioning ETS	F2F / Online	2h	
	4	Diagnostics ETS	F2F / Online	2h	
Theoretical	5	KNX Topology	F2F / Online	1h	
	6	KNX RF	F2F / Online	1h	
				<b>8 hours (1 day)</b>	

<sup>11</sup> For requirements of online courses check 2.2



#### 2.1.7.1 Requirements with regard to the KNX Refresher course

- The duration of the course is at least 8 hours;
- The student must attend the course at least 75 % of the total course duration;
- **The Refresher course documentation can be established by the training centre itself, based on the available Basic course training documentation;**
- In order to attend the Refresher course, the students must have successfully attended the KNX Basic course before;
- All topics of the KNX Refresher course documentation shall be dealt within the above-mentioned period of time;
- Theoretical as well as practical part shall be conveyed by a KNX certified tutor;
- One KNX tutor shall be available for every 16 students during practical classes;
- The proportion of practical classes shall be at least 50 % of the entire course duration;
- KNX Tutor must confirm the presence of the student after the course.

## 2.2 KNX Online Courses

### 2.2.1 KNX Preparatory Basic course

The preparatory Basic course is a complete online course of which the (certified) theoretical part and the **non-certified practical part** is organized via an online distance learning platform, i.e., via a Live E-learning platform or a Self-paced E-Learning platform.



***A training centre can only request for approval of Preparatory Basic courses if it has been approved for the organization of KNX Basic courses.***

### 2.2.2 KNX Preparatory Advanced course

The preparatory Advanced course is a complete online course of which the (certified) theoretical part and the **non-certified practical part** is organized via an online distance learning platform, i.e., via a Live E-learning platform or a Self-paced E-Learning platform.



***A training centre can only request for approval of Preparatory Advanced courses if it has been approved for the organization of KNX Advanced courses.***

Two theoretical/practical online distance training options are currently possible, i.e., the **Live E-Learning** platform and the **Self-Paced E-Learning** platform:

1. Live E-Learning (e.g., Adobe Connect, Zoom, Microsoft Teams, WebEx, GoToWebinar, Skype etc.)
2. Self-paced E-Learning in which the student can follow the course at his/her own pace (e.g., Moodle, recorded/interactive videos, simulations etc.) without any geographical constraint.

The below table shows for which type of courses and for which parts, Online Distance training platforms (Live E-learning or Self-Paced E-Learning), can be used.

	<b>Certified Theoretical</b>	<b>Certified Practical</b>	<b>Non-certified practical</b>
<b>Basic Course</b>	<b>x</b>	-	-
<b>Advanced Course</b>	<b>x</b>	-	-
<b>HVAC Specialist</b>	<b>x</b>	-	-
<b>Tutor course</b>	<b>x</b>	-	-
<b>Refresher Course</b>	<b>x</b>	<b>x</b>	-
<b>Preparatory Basic</b>	<b>x</b>	-	<b>x</b>
<b>Preparatory Advanced</b>	<b>x</b>	-	<b>x</b>

### **Basic/Advanced/HVAC Specialist/Tutor/Refresher/Preparatory Basic/Advanced course**

The theoretical part of the above courses can be given via an online distance training platform and can then be considered part of a certified KNX course. This is shown by the words in the table “***certified theoretical***”.

#### **Refresher course**

The practical part of the above course can be given via an online distance training platform and can then be considered part of a certified KNX course. This is shown by the words in the table “***certified practical***”.

#### **Preparatory Basic/Advanced course**

The practical part of the above courses can be given via an online distance training platform, but they are never considered as part of a certified KNX course. This is shown by the words in the table “***non-certified practical***”. This practical part needs to be re-done as part of Condensed Practical Basic/Advanced course or even – if the customer decides to do so - a full Basic/Advanced course.

## **2.2.3 Requirements with regard to Online Courses in general**

### **2.2.3.1 Requirements Live E-Learning:**

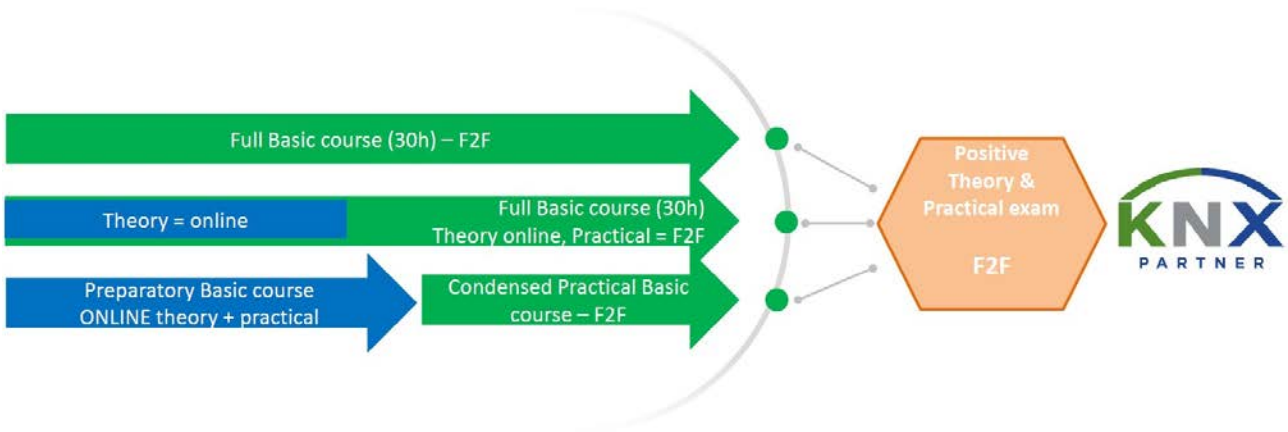
- The live courses must be organized by a KNX certified tutor;
- Only students registered in MyKNX for that specific course shall be able to access the live E-Learning platform;
- Courses may not be recorded and put online;
- The student attendance rate shall be measured/calculated;
- The entire content of the standardized training documentation in PDF may only be accessible to subscribed students via username and password obtained through the KNX certified training centre upon subscription.
- For the certified practical part of the Refresher course **and** the non-certified practical part of the Preparatory Basic/Advanced course, the following practical tools can be amongst other used:
  - KNX Virtual
  - proprietary KNX simulator programs
  - remote access to the training rig via KNX IP Tunneling
  - etc.with or without online support from the KNX tutor.

### 2.2.3.2 Requirements for Self-Paced E-Learning:

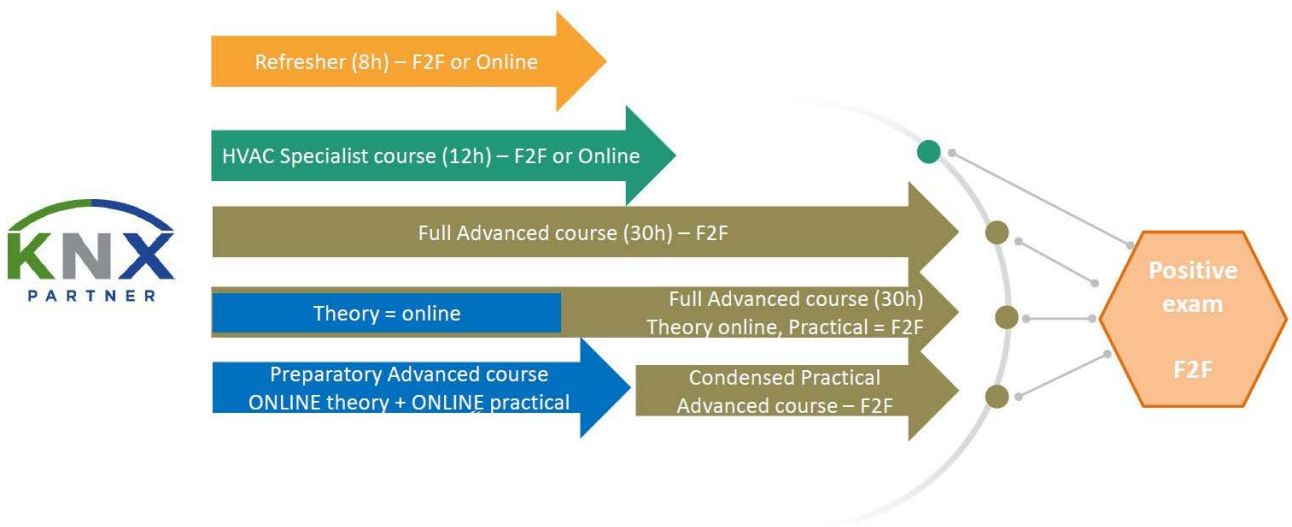
- Self-paced E-Learning programs shall be developed in close cooperation with a KNX certified tutor;
- Students shall be able to access the online platform via a unique username and password that will expire after the course has ended;
- After each theoretical chapter, a “checkpoint” shall be foreseen consisting of a set of questions to test the knowledge acquired by the students. These questions may not be taken from the pool of the official KNX theoretical exam statements. Only when succeeding the checkpoints, shall the student be allowed to proceed to the next chapter;
- A KNX certified tutor shall help the students by means of either a discussion board, chat sessions or emails. The answer to such questions shall be given maximum 12 hours after the student has raised his/her question;
- The student attendance rate shall be measured/calculated;
- The entire content of the standardized training documentation in PDF may only be accessible to subscribed students via username and password obtained through the KNX certified training centre upon subscription.
- For the non-certified practical part of the Preparatory Basic/Advanced course, the following practical tools can be amongst other used:
  - KNX Virtual
  - proprietary KNX simulator programs
  - remote access to the training rig via KNX IP Tunneling
  - etc.with or without online support from the KNX tutor.

## 2.3 Possible course tracks prior & after KNX Partnership

### 2.3.1 Possible course tracks prior to KNX Partnership



### 2.3.2 Possible course tracks after KNX Partnership (phase 1)



### 2.3.3 Possible course tracks after KNX Partnership (phase 2)




## 2.4 Grand summary: KNX course types

	Preparatory Basic	Condensed Practical Basic	Basic course	Refresher course	HVAC Specialist	Preparatory Advanced	Condensed Practical Advanced	Advanced course	Tutor course
Intended for?	Newcomers with no KNX knowledge	Self-educated person (incl. those who attended Prep. Basic course)	Newcomers, Electrical installers, architects...	Existing KNX partners who wish to refresh their knowledge	Partner who wishes to deepen his/her knowledge on KNX HVAC	KNX Partners preparing online for a later Condensed practical Advanced course	Self-educated KNX partner (incl. those who attended a Prep. Advanced course)	KNX partners wishing to broaden their knowledge on KNX	If you want to start up a training centre yourself.
Required course before?	No	No	No	Basic or Condensed Basic	Basic or Condensed Basic	Basic or Condensed Basic	Basic or Condensed Basic	Basic or Condensed basic	Basic and Advanced course
Minimum duration course incl. exam	-	15h <sup>12</sup>	30h	8h	12h	-	15h <sup>12</sup>	30h	18h
Certified Theory F2F	-	-	Yes	Yes	Yes	-	-	Yes	Yes
Certified Theory Online	Yes	-	Yes	Yes	Yes	Yes	-	Yes	Yes
Certified Practical F2F	-	Yes	Yes	Yes	Yes	-	Yes	Yes	-
Certified Practical online	No	No	No	Yes	No	No	No	No	-
<i>Practical non-certified possible?</i>	Yes	No	No	No	No	Yes	No	No	No
Theory exam F2F	-	Yes	Yes	-	Yes	-	Yes	Yes	Yes
Theory exam online	-	-	-	-	-	-	-	-	No
Practical exam F2F	-	Yes	Yes	-	-	-	Yes	Yes	-
Min. score for passing exam(s)	-	60 % <sup>13</sup>	50 %	-	50 %	-	60 % <sup>13</sup>	50 %	60 %

<sup>12</sup> Until further notice, 8 hours

<sup>13</sup> Until further notice, 50 %

## Requirements for KNX Training Centres

	Preparatory Basic	Condensed Practical Basic	Basic course	Refresher course	HVAC Specialist	Preparatory Advanced	Condensed Practical Advanced	Advanced course	Tutor course
Official Certificate	-	Yes	Yes	Yes	Yes	-	Yes	Yes	Yes
Official KNX logo	-	Yes, 		-	-	-	-	-	-
Partner credits	-	30	40	10	15	-	15	20	10

### 3 General requirements for organizing a KNX course

#### 3.1 Tutor certificate

One of the requirements for organizing a KNX course is that the tutor has followed a KNX Tutor course and has successfully passed the KNX Tutor exam. The KNX Tutor course can be followed at KNX training centres which are accredited for the organization of KNX Tutor courses (KNX++ training centres). A prerequisite for following the Tutor course is however that the student prior to the KNX Tutor exam has successfully passed the KNX Basic and Advanced course exam.



***Only a KNX tutor who has the KNX tutor certificate shall conduct the theoretical as well as the practical part of KNX courses. During practical classes, it is allowed that the KNX tutor is assisted by a colleague who has the partner certificate. KNX Association has the right to inspect the acquired KNX tutor certificate at all times.***



***Recommendation: the KNX certified training centre should have at least one KNX certified tutor on the payroll***

#### 3.1.1 Recommendations for KNX tutors

##### ***Teaching experience***

A KNX tutor should be able to present proof of educational knowledge and experience in technical adult training.

##### ***Practical experience in conventional electrical installation techniques***

A KNX tutor should be familiar with the conventional electrical installation techniques. Only in this way is he able to assess the application of the KNX bus and spell out convincingly its advantages.

##### ***Knowledge of other bus systems in Building System Engineering and building automation***

As the KNX bus system is frequently compared to other bus systems in building system engineering and building automation, KNX tutors should be capable of explaining similarities and differences between different bus systems and be able to convey this to the students.

##### ***Update of tutor knowledge***

The tutor shall keep him/herself continuously up to date with the latest KNX developments in any or several of the underneath ways:

- Study of any new versions of the KNX tutor documentation made available electronically to certified training centres;
- Participation in the annual KNX conference for training centres;
- Study of the bi-annual KNX journal;
- Study of KNX related product documentation;
- Visits to national or international fairs with main focus on building automation;



## 3.2 KNX Training equipment

The training centre shall own at least two fixed or mobile workstations. Maximum two students are allowed to work on one training rig. The training rigs may not be rented from other training centres or institutions.

### 3.2.1 Equipment required for Basic course, Condensed Practical Basic course, Refresher course and Preparatory Basic course

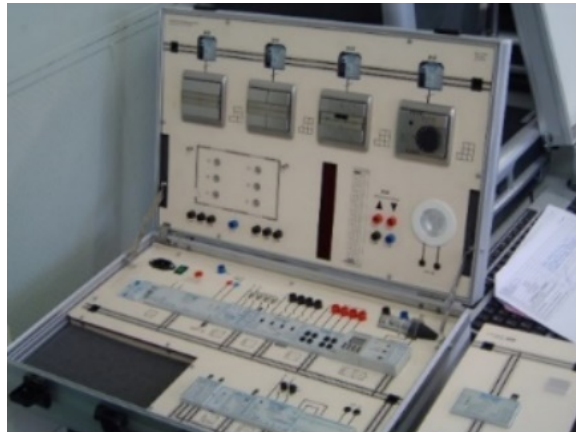
The underneath mentioned product types shall be available in each training rig:

- Switch actuator
- Dimming actuator
- Shutter actuator
- The above products can be replaced by a multifunction actuator, e.g., switch/shutter actuator or a dim/switch actuator etc.
- Sensors with functions to “switch”, “relative dimming” and “drive control” (shutter)”
- Line coupler or IP router
- Power supply
- 1 **KNX RF S-Mode sensor** and 1 **KNX TP/RF media coupler** installed on one training rig (this material must only be purchased if the training centre is located in a country in which the 868 MHz frequency is allowed)

**Example of a fixed training rig**



**Example of a mobile training rig**



### **3.2.2 Equipment required for Advanced course, Condensed Practical Advanced course and Preparatory Advanced course**

The underneath mentioned product types shall be additionally available in each training rig next to the equipment listed under 3.2.1:

- Individual room controller
- Fan coil actuator
- Logical modules (standalone or part of other available equipment)
- Input devices with monitored cables / alarm system with a certified KNX interface
  - Input devices with monitored cables are more complex devices than regular KNX binary inputs. The required input devices offer the possibility to trigger alarms in case of short-circuiting the cable
- Weather station
- KNX/DALI Gateway

### **3.2.3 Equipment required for KNX HVAC Specialist course**

The underneath mentioned product types shall be available in each training next to the products listed under 3.2.1.

- Individual room controller
- Fan coil actuator
- Logical modules (standalone or part of other available equipment)
- Weather station
- Recommended: Visualization panel with integrated room temperature controller

### **3.2.4 Equipment required for Tutor course**

There is no need for extra KNX components for this course.

## **3.3 Computer / Software**

- The computer of the tutor shall be equipped with an ETS Professional license.
- On the student's PC at least an ETS Lite shall be installed. The student is allowed to bring his/her own PC to the course.

## **3.4 Media equipment**

It is recommended that the training rooms are subdivided into a theoretical and a practical room. Projector, smart board, or similar media equipment shall be available in the room(s).

## 4 Obligations before / during / after the organization of a KNX Course

### 4.1 Before the organization of a KNX course

Once the student has subscribed himself to the course and once all internal administrative tasks have been carried out (e.g., course fees paid etc.), the training centre has to confirm the participation of the student to the course in his MyKNX account.

See <https://support.knx.org/hc/en-us/sections/360005610600-Course-management> for more information.

#### 4.1.1 Timetable (see example Annex 6.10)

A timetable of the KNX course needs to be drawn up to document the number of hours allocated to the various topics of the KNX course. The timetable shall also include possible breaks, lunches... as well as the duration of the theoretical and practical exam. This timetable can also be shown on the website of the training centre. The following elements are an indispensable part of a timetable:

- Name of the course;
- Date of the course;
- Training documentation version used during the course;
- Number of allocated hours to each chapter including possible breaks, lunches...;
- Exam duration;
- Location where the course was organized;
- Name or number of the classroom;
- Name of the KNX tutor(s);

See <https://support.knx.org/hc/en-us/sections/360005610600-Course-management> for more information.

## **4.2 During the organization of a KNX course**

### **4.2.1 Safety Procedure (see example Annex 6.9)**

Right before the KNX course starts, it is important to inform the students on the relevant safety procedures. These safety procedures can be oral or written guidelines to prevent possible hazards and thus achieve a maximum degree of efficiency and safety during the KNX course.

### **4.2.2 Attendance List**

There are two possibilities to document the presence of the student in the KNX course:

- The tutor checks whether the student is present every class day and marks this in his attendance list;
- Each student individually signs the attendance list at the beginning of each class day;

### 4.3 After the organization of a KNX Basic course

#### 4.3.1 Entering results of a KNX Basic course

See <https://support.knx.org/hc/en-us/sections/360005610620-Exam-management> for more information.

#### 4.3.2 Issuing the KNX Basic/Advanced/HVAC Specialist/Tutor/Refresher course certificate (Optional)

Each student will after successful exam receive an electronic certificate in his/her MyKNX account. If a KNX training centre decides to also issue a paper certificate (not an obligation), then it must do so on the electronic certificate template that is available in MyKNX. The content of the certificate can be found in the annexes of this document and must contain the following details:

- name, date, and place of birth of the student
- title and contents of the course
- duration and time of the course
- date of issue, name of training centre (with logo of the training centre)
- place of examination
- signature of head of training and KNX certified tutor

#### 4.3.3 Archiving of documents used before, during and after the course

The underneath listed documents shall be archived for at least the underneath specified time:

No	Documents to be archived	Archiving - duration
1.	Print-out building view documentation <sup>14</sup>	Papers of the last two conducted practical exams

<sup>14</sup> Results of the practical test and the building documentation can be archived in paper or electronic format (e.g., printed out by Acrobat or similar).

## 5 KNX Certification procedure

### 5.1 Registration phase:

In order to become a KNX certified training centre, the interested training centre completes the online application in its personal MyKNX account (menu: Account – Applications – Become a KNX Certified Training Centre). Once approved by KNX Association, the KNX training centre will have access to the training resources (possibility to create courses, download training documentation, etc.)

#### 5.1.1 KNX Training documentation

Each KNX certified training centre will have automatically access to the Word version and/or the PowerPoint presentations of the KNX training documentation. This documentation will assist the KNX tutor to convey the necessary level of basic knowledge to the students. Students of a KNX course have the right to receive from the KNX certified training centre, a printed version, or a PDF copy of this training documentation.

KNX Training centres may modify this training documentation according to the KNX devices available in their classes and according to their own local and organizational needs. Training centres are also allowed to put their training centre logo on the training documentation.

Should the training centre establish own documentation based on the KNX training documentation, a cross reference list must be available, showing how the subjects of the KNX training documentation are dealt with in the own documentation. Such a list must be kept up to date with new releases of the KNX and own training documentation.



***New versions of the training documentation as supplied by KNX Association shall be immediately used during KNX courses.***

See <https://support.knx.org/hc/en-us/sections/360005646419-Setting-up-a-Training-centre> for more information.

## 5.2 Certification phase:

KNX Association grants the respective KNX certificate after successful assessment of the requested documentation (i.e., KNX tutor certificate, photos & invoices of training rigs and media equipment)

## 5.3 Surveillance phase:

The continuous compliance of the training centre to the KNX certification program is checked on the basis of the completed online satisfaction surveys that are filled out by the KNX students.



***KNX Association has the right to organize surprise on-site inspections. If the inspector detects any irregularities or shortcomings, the expenses made by the KNX inspector shall be borne by the KNX training centre.***

For all other important topics with regard to:

- Updating your training centre profile
- Incentives given to students who attend a standardized course
- Organizing an online/offline exam
- Exam regulations
- Training centre fees
- Advantages for training centres
- Activation of ETS Lite license
- ...

we urge you to visit the KNX help centre on: <https://support.knx.org/hc/en-us/categories/360003152139>

## 6 Annexes

### 6.1 KNX Basic course

## KNX Training centre

# Training Centre Logo

# CERTIFICATE

Mr. John Jones  
born on 15 May 1995  
in London

has successfully attended the

## KNX Basic course with exam

The KNX Basic course was organized at the above-mentioned training centre from xx.xx.20xx until xx.xx.20xx. The KNX exam consisted of:

- **Theoretical exam** based on the uniform KNX training documentation (KNX System Arguments, KNX System overview, KNX TP Topology, KNX Bus Devices, KNX TP Installation, KNX RF, ETS Project Design, ETS Commissioning, ETS Diagnostics)
- **Practical exam** - planning, commissioning, and diagnostics of a predetermined KNX project

Examination location: Brussels, 20 February 20xx

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Head of Training Centre

-----  
KNX certified tutor



## 6.2 Condensed Practical Basic course

### KNX Training centre

# Training Centre Logo

# CERTIFICATE

Mr. John Jones  
born on 15 May 1995  
in London

has successfully passed the

## Condensed Practical Basic course with Exam

The KNX practical course as well as the exam was held at the above-mentioned certified training centre from xx.xx.20xx until xx.xx.20xx. The KNX exam consisted of:

- **Theoretical exam** based on the uniform KNX training documentation (KNX System Arguments, KNX System overview, KNX TP Topology, KNX Bus Devices, KNX TP Installation, KNX RF, ETS Project Design, ETS Commissioning, ETS Diagnostics)
- **Practical exam** - planning, commissioning, and diagnostics of a predetermined KNX project

Examination location: Brussels, 20 February 20xx

-----  
Head of Training Centre

-----  
KNX certified tutor

### 6.3 KNX Advanced course

## KNX Training centre

# Training Centre Logo

# CERTIFICATE

Mr. John Jones  
born on 15 May 1995  
in London

has successfully attended the

## KNX Advanced course with exam

The KNX Advanced course was organized at the above-mentioned certified training centre from xx.xx.20xx until xx.xx.20xx and consisted of the following topics:

- Flags
- HVAC control with KNX
- Interworking
- Couplers
- IP Communication
- KNX Secure
- KNX Telegram
- Lighting Control
- Security technology
- Logic Operations
- Visualization Systems
- Theoretical and Practical test (error finding, telegram/device analysis, project design)

Examination location: Brussels, 20 February 20xx

.....  
Head of Training Centre

.....  
KNX certified tutor

## 6.4 Condensed Practical Advanced course

KNX Training centre

# Training Centre Logo

# CERTIFICATE

Mr. John Jones  
born on 15 May 1995  
in London

has successfully attended the

## Condensed Practical Advanced course with exam

The KNX practical course as well as the exam was organized at the above-mentioned certified training centre from xx.xx.20xx until xx.xx.20xx and consisted of the following topics:

- Flags
- HVAC control with KNX
- Interworking
- Couplers
- IP Communication
- KNX Secure
- KNX Telegram
- Lighting Control
- Security technology
- Logic Operations
- Visualization Systems
- Theoretical and Practical test (error finding, telegram/device analysis, project design)

Examination location: Brussels, 20 February 20xx

-----  
Head of Training Centre

-----  
KNX certified tutor

## 6.5 KNX HVAC Specialist course

KNX Training centre

# Training Centre Logo

## CERTIFICATE

Mr. John Jones  
born on 15 May 1995  
in London

has successfully attended the

### KNX HVAC Specialist course with exam

The KNX HVAC Specialist course was organized at the above-mentioned certified training centre from xx.xx.20xx until xx.xx.20xx and consisted of the following topics:

- Basic Know-How
- Heat distribution installations
- Heat generators
- Legal framework
- To understand “Controlling and regulating”
- Heating control
- Drinking water heating
- Energy efficiency with KNX
- Concluding KNX Theoretical exam

Examination location: Brussels, 20 February 20xx

.....  
Head of Training Centre

.....  
KNX certified tutor

## 6.6 KNX Tutor course

### KNX Training centre

# Training Centre Logo

## CERTIFICATE

Mr. John Jones  
born on 15 May 1995  
in London

has successfully attended the

### KNX Tutor course with exam

The KNX Tutor course was organized at the above-mentioned training centre from xx.xx.20xx till xx.xx.20xx. The KNX exam consisted of:

- KNX requirements for training centres
- Structure and scope of KNX Association
- KNX software
- Serial data transmission
- Microcontrollers
- KNX application programs
- KNX certification scheme for KNX products
- History of bus systems
- Concluding theoretical exam

Examination location: Brussels, 20 February 20xx

.....  
Head of Training Centre

.....  
KNX certified tutor

## 6.7 KNX Refresher course

### KNX Training centre

# Training Centre Logo

## CERTIFICATE

Mr. John Jones  
born on 15 May 1995  
in London

has successfully attended the

### KNX Refresher course

The KNX Refresher course was organized at the above-mentioned training centre on xx.xx.20xx.  
The course consisted of the following chapters:

- Project Design ETS: Basic
- Commissioning ETS
- Diagnostics ETS
- KNX Topology
- KNX RF

Brussels, 20 February 20xx

-----  
Head of Training Centre

-----  
KNX certified tutor

## 6.8 Attendance Confirmation Basic course

KNX Training centre

# Training Centre Logo

## ATTENDANCE CONFIRMATION

Mr. John Jones  
born on 15 May 1995  
in London

has attended the training session

### KNX

*Course title: KNX Basic course*

Contents:

- KNX System arguments
- KNX System overview
- KNX TP Topology
- KNX Bus devices
- KNX TP Installation
- KNX RF
- ETS Project Design
- ETS Commissioning
- ETS Diagnostics

Duration: 12.02.20xx – 15.02.20xx  
30 hours

Brussels, 20 February 20xx

.....  
Head of Training Centre

.....  
KNX certified tutor

## 6.9 Example of Safety regulation

This document describes the following basic rules for the handling of installed KNX components to ensure the safety of persons and equipment.

1. Always press the main safety switch before handling any device from your training rig.
2. Do not try to connect the power supply while this is already pre-connected to the mains.
3. Do not change anything to the power circuit (switches, lamps, etc....) when these are still plugged in.
4. Both sensors and actuators should be handled with care.
5. Do not remove any modules from the training rig
6. In case connected devices to the bus have to be replaced, it must be done very carefully. Do not use excessive force to replace them.
7. In case of fire, do not use the elevators, but use the stairs in order to exit the building.
8. ...

Complementary to the above, in order to ensure the proper behavior of the KNX installation, the students and teacher shall only use KNX certified devices as well as legal copies of ETS.

The student undersigned acknowledges that the rules mentioned in this document have been explained, and he agrees with them
First name & last name:
Signature:
Date:



## 6.10 Example of a Basic course timetable

Room: \_\_\_\_\_ KNX Tutor: \_\_\_\_\_

Date course: \_\_\_\_\_

Training Documentation Version: \_\_\_\_\_

Location: \_\_\_\_\_

### KNX Basic course 07/2021

Time	Monday	Tuesday	Wednesday	Thursday	Friday
09:00 10:00	System Arguments KNX RF	System overview	Topology	Installation	ETS Diagnostics
10:00 11:00	System overview				
11:00 12:00	System overview	Topology	Bus devices KNX RF	Installation	ETS Diagnostics
12:00 13:00	Lunch	Lunch	Lunch	Lunch	Lunch
13:00 14:00	ETS Project Design	ETS Project Design	ETS Commissioning	ETS Commissioning	Summary: Practical
14:00 15:30	ETS Project Design	ETS Project Design	ETS Commissioning	ETS Commissioning	Theoretical exam
15:00 15:30	Break	Break	Break	Break	Break
15:30 17:00	ETS Project Design	ETS Project Design	ETS Commissioning	ETS Commissioning	Practical exam

