

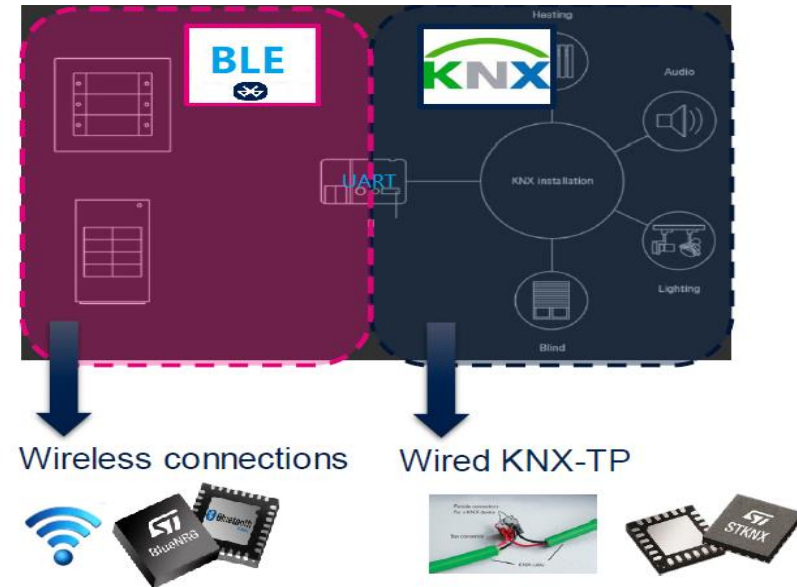
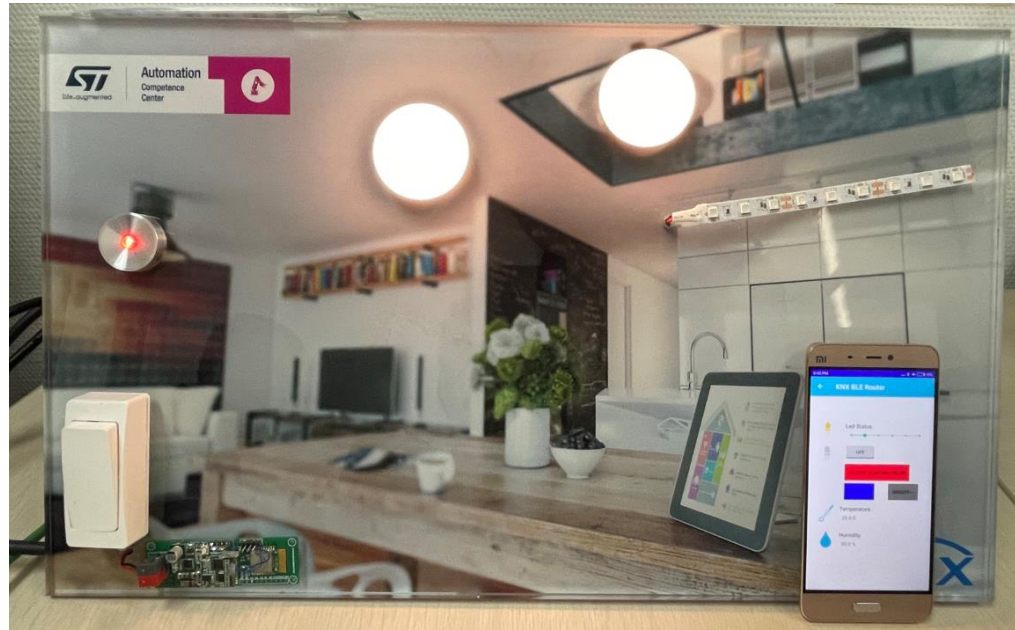


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BLE-KNX Lighting Control for SMART Home Demo

Automation
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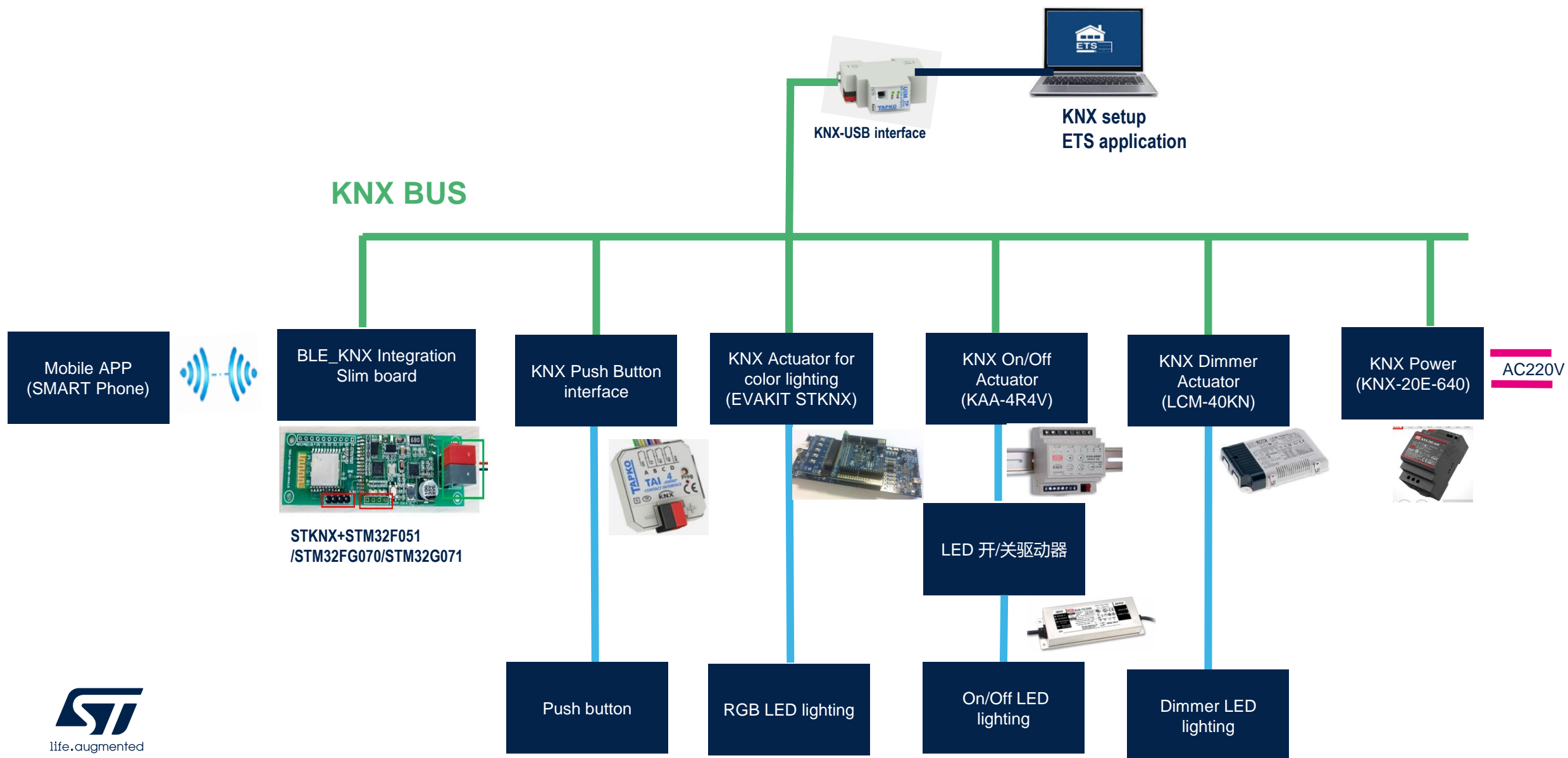




- This Demo Panel is an integrated KNX and BLE control system to remotely control different on/off and dimmer lighting via mobile App, of which the dimmer lighting consists different level of brightness and multiple choices of color. Temperature and humidity which come from KNX bus can be displayed on the mobile App.
- This demo aims to show a smart lighting control system and a reference design for KNX TP with wireless extension via the BLE device.
- The whole panel system are separated to three parts: Mobile APP, BLE-KNX integration slim board and the reset KNX TP devices.

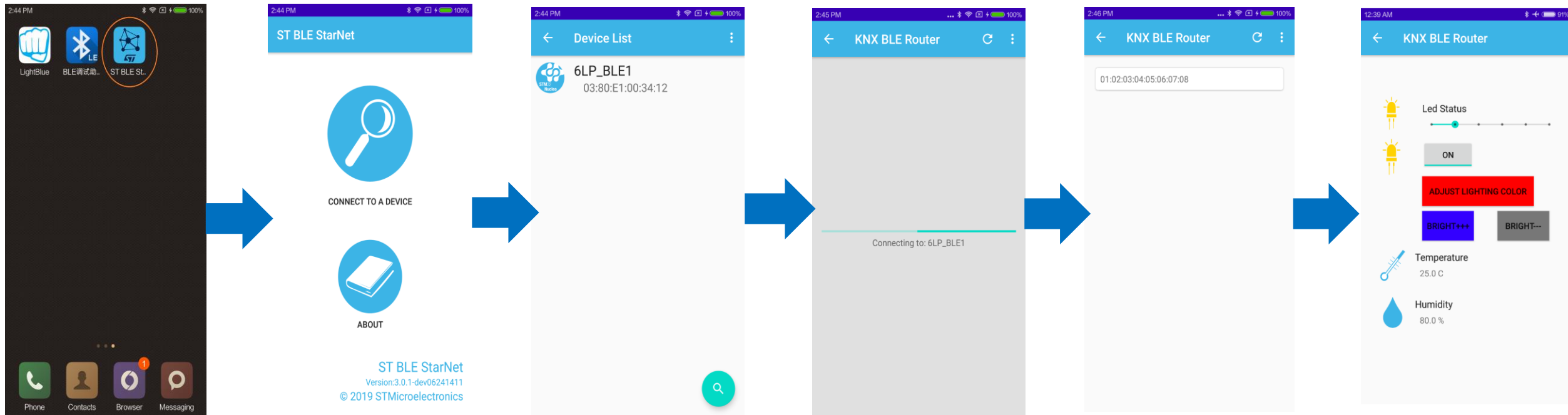


System block diagram





- The App was developed based on latest ST BLE StarNet Android version(3.0.1),the device list only list BLE devices which follow ST BLE StartNet protocol which was used between APP and BLE devices.
- The App was used to adjust dimmer lighting brightness with absolutely or relatively setting, adjust lighting color, switch on/off lighting. Display temperature and humidity values which come from KNX bus.
- The APP demands are sent to BLE device.
- The following is the operation process for entering lighting control HMI.





BLE-KNX Integration Slim board

- The slim board integrated an BLE device module(BlueNRG2-232) and STKNX module(STKNX+STM32F051/G070/G071), the BLE device receives commands from APP, and then send them to STKNX module via UART port. Through the BLE device, KNX TP was extended to a wireless system.
- The slim board include receive lighting control information from mobile App via BLE communication , there are include on/off lighting control, absolutely and relatively dimmer lighting control , lighting color setting. All information will be sent to KNX Bus with defined KNX group address which are set via ETS.
- 6 Led are used for indicating BLE and KNX module work status. The KNX module can be used independently.
- A ETS5 project was build which was used for configuring Slim board communication objects.
- 6 IO ports and 2 ADC ports are reserved on BLE module for extending more functions based on application request in future.



BLE-KNX Integration Slim board



BLE+STKNX+STM32F051



BLE+STKNX+STM32G070/G071



STKNX+STM32G070

Available Communication objects List:

Number ^	Name	Object Function	Description	Group Address	Length	C	R	W	T	U	Data Type	Priority
0	In1-Switch	In1-Switch	New group address	1/1/6	1 bit	C	R	W	T	U	switch	Low
1	RSC1-Dimming	RSC1-Dimming	New group address	1/1/1	4 bit	C	R	W	T	U	dimming control	Low
2	ASC1-Dimming	ASC1-Dimming	New group address	1/1/2	1 byte	C	R	W	T	U	percentage (0..255%)	Low
3	In2-Switch	In2-Switch			1 bit	C	R	W	T	U	switch	Low
4	RSC2-Dimming	RSC2-Dimming	New group address	1/1/3	4 bit	C	R	W	T	U	dimming control	Low
5	ASC2-Dimming	ASC2-Dimming	New group address	1/1/4	1 byte	C	R	W	T	U	percentage (0..255%)	Low
6	In3-Switch	In3-Switch	New group address	1/1/5	1 bit	C	R	W	T	U	switch	Low
7	In3-Force	In3-Force			2 bit	C	R	W	T	U	enable control	Low
8	In3-Scene	In3-Scene			1 byte	C	R	W	T	U	scene control	Low
9	Out1-ONOFF-Status	Out1-ONOFF-Stat...	New group address	1/1/12	1 bit	C	R	W	T	U	switch	Low
10	Out2-ONOFF-Status	Out2-ONOFF-Sta...	New group address	1/1/13	1 bit	C	R	W	T	U	switch	Low
11	Dimmer1-Relatively	Dimmer1-Relatively	New group address	1/1/10	4 bit	C	R	W	T	U	dimming control	Low
12	Dimmer1-Absolutely	Dimmer1-Absolut...	New group address	1/1/11	1 byte	C	R	W	T	U	percentage (0..255%)	Low
13	TemperatureValue	TemperatureValue	New group address	1/1/7	2 bytes	C	R	W	T	U	temperature (°C)	Low
14	HumidityValue	HumidityValue	New group address	1/1/8	2 bytes	C	R	W	T	U	humidity (%)	Low
15	ColorSetValue	ColorSetValue	New group address	1/1/9	1 byte	C	R	W	T	U	counter pulses (0..255)	Low

Notes : Every communication object function and type can be redefined through ETS manufacture tool.



Reset KNX devices on system



KNX Push button interface: it used for sending on/off command to KNX bus.



KNX On/Off Actuator(KAA-4R4V): It's an on/off actuator which used for receiving on/off control demand from KNX bus , then control the LED driver



KNX Power: It's used to provided power to KNX system.



KNX Actuator for controlling lighting color and brightness, it was acted via a EVAKIT STKNX board+X-NUCLEO-LED16A1. this actuator receive color and brightness setting command from KNX bus, then adjust light color and brightness.



KNX Dimmer Actuator(LCM-40KN):It's used for receiving dimmer control demand from KNX bus and output 0—10V voltage for control LED light.

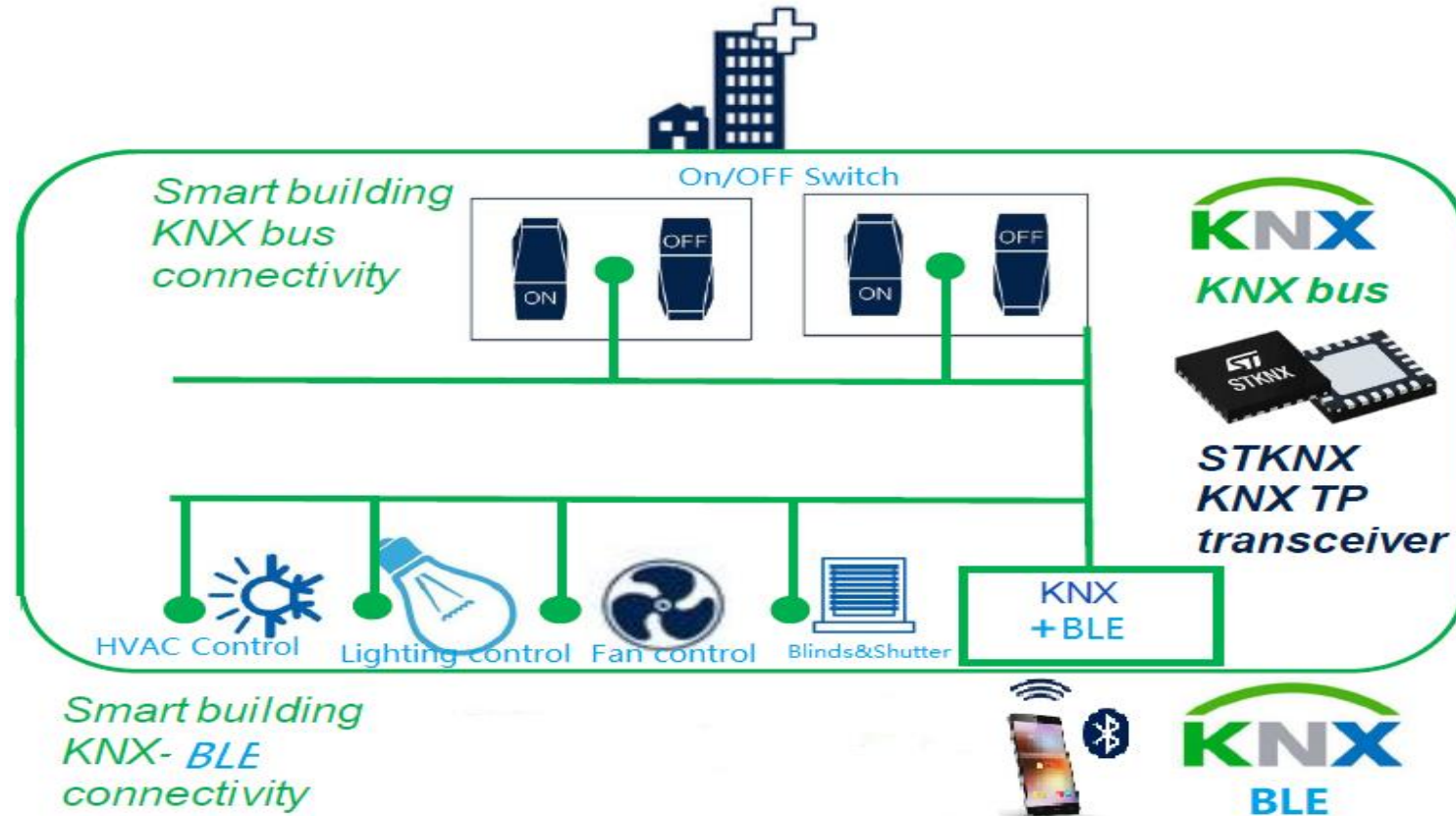


KNX-USB interface: It enables a data connection between the PC and the KNX BUS



Extended Application

Besides lighting control system, it can also be extended to demonstrate other KNX building systems such as HVAC, Blind & Shutters, security & monitor system etc. as mentioned on previous, just need to modified objects type based on application type, then do some update STKNX module's application part.





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